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PATHOLOGICAL FINDINGS IN DEATHS DURING ANÆSTHESIA.[1]

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THIS paper is a review of pathological findings in connexion with 107 deaths during anæsthesia into the causes of which inquests have been held by the city coroner of Melbourne between July 1, 1919, and June 30, 1929. It has not proved practicable to trace the equally large number of deaths which have not been the subjects of judicial inquiry.

Definition.

The 107 deaths include (i) patients who have died while they were in a state of anæsthesia, (ii) patients who, having been returned to bed, have died before awakening from the effects of the anæsthetic. It has been thought desirable to exclude all patients who have succumbed to the effects of grave injury or disease some hours after the termination of the administration of the anæsthetic and those who have died of postoperative pneumonia; it is unnecessary to report these deaths to the coroner save in the event of accident or suspicious circumstances.

Distribution of Deaths.

The place of death is distributed between public and private hospitals, doctors' and dentists' surgeries and private houses in the following relationship: Public hospitals 73 deaths, private hospitals 20 deaths, medical practitioners' or dentists' surgeries six deaths, private houses six deaths. The total is 105. In two instances the anæsthetic agent appears to have been self administered.

The type of anæsthetic agent was general anæsthetic in 99 instances and local anæsthetic in eight. The total was 107.

Percentage Anæsthetic Mortality.

Clearly the coroner's office can here give us no information in regard to the percentage anæsthetic mortality. We must look to the great metropolitan hospitals. Figures from one such hospital (provided by the courtesy of a member of the honorary medical staff and of the Medical Superintendent) are given in the following table, though it is unfortunate that no classification of deaths according to the anæsthetic agent employed is available.

TABLE I.
Anæsthetics Administered, 1919–1929.

Anæsthetic Administered.	Number of Administrations.
Local anæsthetics	8,573
Ethyl chloride	3,005
Ethyl chloride to open ether	33,814
Ethyl chloride to intratracheal ether	4,979
Open ether	1,247
Chloroform	1,441
Nitrous oxide and oxygen	589
Ethylene and oxygen	286
Unclassified	1,683

At another metropolitan hospital where no such detailed records have in the past been kept, the following data have been provided: In the in-patient theatres for major surgery and for adult patients from the nose and throat department 13,400 operations were performed with 24 deaths; this yields an anæsthetic mortality rate of 1·8‰. In the out-patient theatres for minor surgery and for juvenile patients from the nose and throat department 13,890 operations were performed with approximately four deaths; this yields an anæsthetic mortality rate of 0·29‰. Combining these figures, not indicative of all anæsthetics, general and local, administered in that hospital during 1919-1929, a figure of 27,290 operations and 28 deaths is obtained, a mortality rate of 1·03‰.

It is thus seen that considering the enormous volume of surgical work done, the percentage mortality is not high. In-patient figures necessarily provide no criterion, inasmuch as the operations are often graver and the patients' condition much lower than that of the out-patients. Also hospital patients as a class are worse anæsthetic risks than those encountered outside the hospitals.

It is now proposed to analyse the data obtainable in connexion with the 107 inquests on the bodies of persons who died during anæsthesia.

Deaths Under Chloroform.

Eighteen deaths have occurred during 1919-1929 under chloroform or mixtures of chloroform with ether.

A general scheme is seen in Table II and full individual details are set out in Table III.

[1] Read at a meeting of the Section of Anæsthetics of the Australasian Medical Congress (British Medical Association), Third Session, Sydney, 1929.

TABLE II.

Induction Stage.	Anæsthetic used in Full Anæsthesia. Minutes till Death. 5	10	? 20	Post-Anæsthetic Stage. Anæsthesia.	Operation Time.	Died After
Chloroform	Chloroform	Chloroform	Chloroform†	Chloroform	2 minutes	60 minutes
Chloroform*				Chloroform	Long	15 minutes
Chloroform*				Chloroform	4 minutes	Immediate
Chloroform				Chloroform	? 20 minutes	Immediate
Chloroform and ether				Chloroform	5 minutes	Immediate

* About to change over to ether. † Previous successful anæsthesia.

TABLE III.

Deaths under Chloroform.

No.	Anæsthetic.	Sex.	Age.	Operation.	Died.	Failed First.	Heart.	Lungs.	Kidneys.	General.	*Ante Mortem.*	Comment.
1	Chloroform and ether.	M.	38	Dental extractions.	Induction.	Respiration.	Large, dilated; mitral 3 fingers, tricuspid 6; muscle thin.	Congested.	Early granular, capsules adhering.	General congestion.	Normal.	Right heart failure in a heart probably rather dilated; chloroform unnecessary.
2	Chloroform.	M.	25	Two quinsies; incision.	1 hour after operation.	Circulation.	Relaxed, dilated, especially right side; walls thin; muscle good.	Congested.	Normal.	Normal.	Airway bad from the quinsies.	Right heart failure; chloroform contraindicated by bad airway and toxicity.
3	Chloroform.	F.	36	Gynæcological examination.	Induction.	Circulation.	Relaxed, dilated, especially right side; walls thin; muscle fairly good.	Congested.	Normal.	Polypoid endometritis.	Normal.	Right heart failure in heart possibly dilated; chloroform not essential.
4	Ethyl chloride and chloroform and ether.	F.	48	Dental extractions.	Proceeding.	Respiration.	Flaccid, dilated, especially right side; otherwise normal.	Congested slightly.	Slight degeneration, capsules adhering, subgranular.	Large goitre.	Rapid pulse attributed to goitre.	Right heart failure; chloroform very risky.
5	Chloroform.	F.	?	Fistula in ano.	10 minutes.	Circulation.	Dilated, especially right side; otherwise normal.	Patchy right pleural adhesions.	Congested.	Normal.	Normal.	Right heart failure, heart possibly dilated; chloroform not essential.
6	Chloroform.	F.	35	Gynæcological examination.	4 minutes, finished.	Circulation.	Relaxed, rather dilated; mitral 4, tricuspid 6; pale clot right ventricle; muscle pale, friable.	Very pale, and engorged frothy fluid.	Pale; normal otherwise.	Cancer of uterine cervix, very anæmic.	Normal.	Cardiac syncope; bad risk; use of chloroform not essential and rather risky.
7	Chloroform.	M.	52	Diathermy, malignant disease of tonsil.	Induction.	Circulation and respiration.	All cavities dilated; muscle poor, pale, friable.	Slight congestion.	Normal.	Liver pale and friable.	Epithelioma of tonsil; else normal.	Cardiac syncope; bad risk; chloroform unavoidable.
8	Chloroform.	F.	40	Colpoperineorrhaphy.	Induction.	Circulation.	Right side dilated, wall thin; mitral 3, tricuspid 5; muscle somewhat friable; slight atheroma base of aorta.	Congested.	Large, congested, smooth, friable.	Congested.	Normal.	Right heart failure, heart possibly abnormal at start.
9	Chloroform.	M.	39	Urethral stricture.	Induction.	Circulation.	Relaxed, right side very dilated and overlaid fat; wall thin; left side dilated; muscle poor.	Congested.	Left large, congested, with swollen cortex; right normal.	Thymus large, persistent.	Bronchitis, ruling out ether.	Right heart failure, probably cardio-renal; chloroform justified 1925.
10	Chloroform.	M.	46	Cerebral tumour.	Operation over 10 minutes.	Respiration.	Rather large; muscle fair.	Normal.	Normal.	Temporo-sphenoid tumour, right.	Bad risk.	Reflex syncope or shock; chloroform not essential.
11	Chloroform.	M.	79	Prostatectomy, second stage.	Bladder opened.	Circulation and respiration.	Large, relaxed, dilated; wall of left ventricle thickened; aortic stenosis; calcareous atheroma aorta and aortic valve and ring; muscle fair.	Emphysema.	Rather soft and degenerate.	Cystostomy (ether) 10 days before; prostrate hypertrophied.	Emphysema, bronchitis, myocarditis; bad risk.	Ether gave mild PN; failure of diseased heart; chloroform justifiable in 1924.
12	Chloroform.	M.	1 9/12	Empyema.	Just over.	Respiration.	Relaxed; muscle toxic-looking.	Double empyema.	Friable.	Spleen large, liver friable.	Very weak; respiration laboured.	Failure of very toxic heart; chloroform justifiable in 1924.
13	Chloroform.	F.	?	Induction labour.	Induction.	Circulation.	Left ventricle enlarged, hypertrophied, dilated, pale clotted blood; left coronary atheromatous; right orifice narrowed, but left obstructed.	Congested.	Congested; chronic Bright's disease.	Liver congested, uterus pregnant.	Nephritis of pregnancy; pulmonary œdema; bad.	Failure of respiration and of toxic diseased heart; chloroform justifiable in 1923.

TABLE III.—*Continued.*

No.	Anæsthetic.	Sex.	Age.	Operation.	Died.	Failed First.	Heart.	Lungs.	Kidneys.	General.	*Ante Mortem.*	Comment.
14	Chloroform.	F.	46	Dental extractions.	Induction.	Circulation.	Right ventricle dilated, overlaid and infiltrated fat; mitral 3, tricuspid 5; some atheroma coronary orifices.	Congested; pleuritic adhesions.	Firm, red, granular, capsules adherent.	Liver large and friable.	Pyorrhœa, and local anæsthetic inadvisable.	Failure of diseased right heart; chloroform not essential.
15	Chloroform.	F.	28	Pelvic exploratory.	Induction.	Circulation.	Right side dilated; mitral 3, tricuspid 5; some dilatation left ventricle; small atheromatous nodule right coronary; spots in aorta.	Congested.	Large, firm, sub-granular; capsules adnering.	Ovaritis; goitre, especially right lobe.	Albuminuria of chronic nephritis.	Failure of right heart; cardio-renal; maybe goitre also was toxic; chloroform risky.
16	Chloroform.	M.	42	Prolapse iris.	Induction.	Respiration.	Large, relaxed; right ventricle overlaid fat; cavities dilated; no fatty degeneration obvious.	Congested; normal otherwise.	Normal.	Liver large, pale, friable.	Normal.	Right heart failure, possibly abnormal myocardium; chloroform not essential.
17	Chloroform and ether, 1 : 3.	F.	7	Tonsils, adenoids.	Just finished.	Circulation.	Large, flaccid, dilated, especially right side; muscle good.	Congested; blood in airways.	Normal.	Normal.	Normal.	Right heart failure; chloroform not essential; cause of death, ?.
18	Chloroform.	M.	10 wks.	Circumcision.	5 minutes.	Respiration.	Left ventricle slightly dilated.	Normal.	Normal.	Thymus large, succulent.	Normal.	*Status lymphaticus*? cardiac syncope; chloroform permissible.

One additional patient apparently with toxic goître was anæsthetized for dental extractions, ethyl chloride and subsequently chloroform-ether mixture, five parts to three, were used. Death occurred during the operation.

FIGURE I.
Graph to show the approximate percentage of deaths at various periods in patients who had died under chloroform anæsthesia.

FIGURE II.
Graph to show the approximate percentage occurrence of various pathological lesions in persons who had died under chloroform anæsthesia.

Pathological Findings.

Association of an abnormal heart with more or less renal degeneration is seen in five persons (numbers 1, 11, 13, 14, 15 of Table III). Case 15 had also a goître, possibly a toxic goître. Definite cardio-renal disease existed in one patient (number 9) in whom the thymus was persistent, although

there was insufficient evidence to justify the diagnosis of *status lymphaticus*. In four (numbers 3, 5, 8, 16) there was some evidence that the cardiac condition may have been abnormal prior to the administration of the anæsthetic.

Toxic goître has been referred to as a possible factor in the death under ethyl chloride and chloroform-ether mixture (number 4). Toxic goître may also have been present in Case 15, the heart being likewise abnormal.

Malignant disease was present in two patients (numbers 6, 7) in whom the heart as well seems to have been affected.

Two patients (numbers 2, 12) possessed a degree of septic absorption likely to impair the quality of the myocardium.

Cerebral tumour was present in one patient (number 10). Failure of the reflex mechanism of the central nervous system following decompression of a tumour is a not unheard of accident of anæsthesia.

It is possible that *status lymphaticus* was present in patient number 18.

In one patient (number 17) no organic cause of death was apparent.

Manner of Death.

From the above it is seen that organic disease, usually of the heart, more or less likely to lower tolerance to chloroform anæsthesia, was present in no less than seventeen of eighteen patients. Failure of the right side of the heart was clinically observed in eleven. Failure of circulation before respiration occurred ten times. Arrest of pulse and respiration seems to have been synchronous in two patients, the mode of death being apparently syncopal. Primary failure of respiration was observed six times.

Choice of Anæsthetic.

Of the eighteen deaths no less than nine were in the phase of induction; this confirms the oft-repeated warning of the danger of this stage of chloroform administration. It is necessary to ascertain how often chloroform was the best possible choice of anæsthetic, having due regard to the cardiac, renal and intercurrent state of the patient that might have been apparent before operation. Reference to Table III will show that the cases may be grouped somewhat thus:

A. Chloroform unavoidable: Number 7, diathermy.

B. Chloroform justifiable. Four cases (numbers 9, 11, 12, 13).

It is assumed that if local anæsthesia was for some reason not indicated, the choice of chloroform becomes perhaps reasonable in the years in question. Today nitrous oxide and oxygen, for instance, would probably be selected, but such anæsthetics had not reached their present general vogue in 1923 to 1925. For one other patient (number 18) the choice of chloroform without change over to ether after the induction period might still be approved by some schools of anæsthetists.

C. Chloroform risky: In five patients (numbers 2, 4, 6, 10, 15) the clinical condition would seem to have made chloroform an unusual risk. There seems to have been no reason why some safer anæsthetic should not have been employed.

D. Chloroform avoidable: There seems to be no reason why chloroform should have been chosen for seven patients (numbers 1, 3, 5, 8, 14, 16, 17) rather than other and less depressing anæsthetic agents.

Conclusions.

Chloroform was responsible for eighteen deaths during 1919-1929. In seventeen of these there was organic (especially cardiac) disease likely to lower the tolerance of the patient to an anæsthetic. One half of the deaths occurred during the induction stage. In one only was chloroform really obligatory. In four, possibly in five, its use was, all things considered, probably justifiable. Chloroform is not to be advised where there is suspicion of lower anæsthetic tolerance nor for routine use.

Deaths Under Ethyl Chloride and "Somnoform."

Considering the enormous number of administrations of ethyl chloride and of "Somnoform," especially in minor and dental surgery, in the induction of anæsthesia to be continued by ether sequence and in the laryngological department, it is curious that the number of deaths under them brought to inquest during 1919-1929 should total only nine. With these, perhaps, might be taken certain of the deaths occurring in the induction stage of the ethyl chloride-ether sequence to be described later.

Owing to the brevity of the operations performed under ethyl chloride and allied substances referred to in Table IV all the patients had undergone actual operative procedure before death occurred; there was therefore an element of operative shock added to the purely depressant effects of the anæsthetic.

In Table IV fuller details of this group of deaths are set forth (see also Figure III).

TABLE IV.

Deaths under Ethyl Chloride and "Somnoform."

No.	Anæsthetic.	Operation.	Time of Death.
1	Ethyl chloride	Dental extractions	Immediate.
2	Ethyl chloride	Tonsils and adenoids	Immediate.
3	Ethyl chloride	Perionychia	3 minutes after finish.
4	Ethyl chloride	Tonsils and adenoids	30 minutes after finish.
5	Ethyl chloride	Œsophageal abscess	Immediate.
6	Ethyl chloride	Tonsils and adenoids	2 minutes after finish.
7	Ethyl chloride	Probing tear duct	Collapse; died next day.
8	"Somnoform"*	Dental extractions	During operation.
9	"Somnoform"*	Dental extractions	Immediate.

* Previous successful anæsthesia.

Pathological Findings.

In two of the patients the heart was apparently abnormal prior to the administration of the anæsthetic (numbers 1 and 8) and an abnormal heart may have been present in another (number 3).

Cardio-renal disease was present in one patient (number 1) who had also an inactive type of tuberculous disease of the lung, diagnosed before the operation as bronchitic.

One patient (number 7) suffered from congenital syphilis; the infant presented no definite organic changes, but was apparently of poor health and resistance.

TABLE V.

Deaths under Ethyl Chloride and "Somnoform."

No.	Anæsthetic.	Sex.	Age.	Operation.	Stage.	Failed First.	Heart.	Lungs.	Kidneys.	General.	*Ante Mortem.*	Comment.
1	Ethyl chloride.	M.	50	Dental extractions.	Just over.	Respiration.	Enlarged, hypertrophied and dilated; mitral and tricuspid 4 fingers; coronaries fair.	Adherent; patchy tuberculosis.	Granular, cystic, degenerated.	Normal.	Cardiac decompensation; "bronchitis."	Cardiac syncope; ethyl chloride risky.
2	Ethyl chloride.	M.	7	Tonsils, adenoids.	Just over.	Respiration.	Dilated; otherwise normal.	Congested.	Normal.	Normal.	Normal.	Cardiac syncope.
3	Ethyl chloride.	M.	23	Perionychia.	Over 3 minutes.	Respiration.	Rather large; right ventricle dilated; tricuspid 5, mitral 2; left coronary, one-third normal diameter.	Inhaled blood; else normal.	Congested.	Generally congested.	Normal.	Right heart failure, heart probably unhealthy.
4	Ethyl chloride.	M.	6	Tonsils, adenoids.	Over ½ hour.	Circulation.	Contracted; else normal.	Inhaled blood and hemorrhages.	Normal.	Enlarged thymus.	Normal.	Cardiac syncope, due ? inhaled blood, or ? *status lymphaticus.*
5	Ethyl chloride.	F.	29	Incision abscess œsophagus.	Over.	Respiration.	Dilated, especially right side; right ventricle thin; muscle good.	Inhaled blood.	Normal.	Suppuration neck; œdema glottis.	Dyspnœa, cyanosis.	Suffocation; anæsthetic held necessary for spasm.
6	Ethyl chloride.	M.	5	Tonsils, adenoids.	Over 2 minutes.	Respiration.	Left ventricle dilated; muscle good.	Congested.	Normal.	Enlarged spleen, thymus, mesenteric glands, Peyer's patches.	Normal.	Cardiac syncope; *status lymphaticus.*
7	Ethyl chloride.	F.	11/12	Probing of tear duct.	Over; collapsed and died next day.	?	Epicardium much thickened; otherwise normal.	Pale, some consolidation, congested posteriorly.	Large, smooth, pale, mottled.	Liver very large, tough and yellow.	Congenital syphilis.	Death from shock; syphilitic child of poor resistance.
8	Somnoform	F.	19	Dental extractions.	Almost over.	Circulation.	Enlarged, hard, dilated; mitral 4, tricuspid 6; coronaries rather small.	Congested.	Normal.	Normal.	An athlete.	Cardiac syncope; heart apparently previously dilated.
9	Somnoform	F.	24	Dental extractions.	Over.	Circulation.	General dilatation, especially right side; muscle thin, flaccid, but of fair quality.	Pleural adhesions right chest; slightly congested.	Normal.	Thymus, thyreoid, tonsils and follicles of tongue enlarged.	Normal.	Cardiac syncope; *status lymphaticus.*

Status lymphaticus was encountered twice (numbers 6, 9). In addition it is possible that one other death (number 4) may have been due to this cause. The evidence is insufficient to decide the relative rôles of the enlarged thymus and the blood found in the airways.

Œdema of glottis was noted once (number 5) and was due to extensive suppuration in the neck muscles after penetration of the œsophagus by a piece of bone.

In one patient (number 2) no lesion was found capable of explaining lowered anæsthetic tolerance.

Manner of Death.

Primary circulatory failure was clinically observed in two patients and in one other (number 4) it is perhaps possible that the circulatory failure was suffocative and hence secondary. One death (number 7) appears to have been principally due to shock.

Choice of Anæsthetic.

A. Drugs risky: In number 1 if ether could not have been used on account of the lung condition and local anæsthetic on account of the state of the mouth, nitrous oxide oxygen (if available) would have been the safest choice. I doubt whether had the real lung condition been recognized, general anæsthesia would have been attempted at all. In number 5 despite dyspnœa and cyanosis a general anæsthetic was requested in order to overcome spasm. Ether administered by the open method or gas and oxygen would have been much safer.

B. Drugs justifiable: So great is the present vogue for this group of anæsthetics, especially in minor surgery, that the risk may be regarded as acceptable if the patient does not present any signs suggestive of a lowered anæsthetic tolerance. By this criterion in seven patients (numbers 2, 3, 4, 6, 7, 8, 9) no contraindication would have existed to the use of ethyl chloride or of "Somnoform."

Conclusions.

Ethyl chloride was responsible for seven deaths in the period from 1919 to 1929. "Somnoform" was responsible for two further deaths. In eight out of the nine patients there was pre-existing organic disease likely to lower the tolerance of the patient to the anæsthetic. In two the choice of anæsthetic (ethyl chloride) conveyed

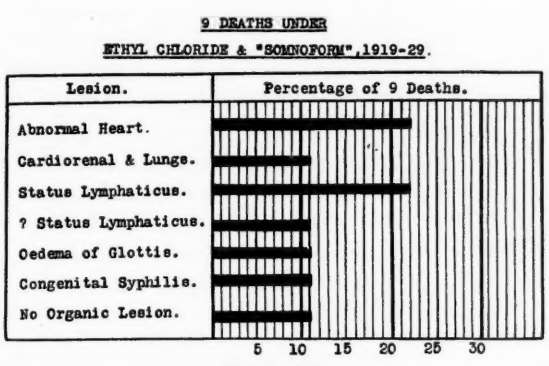

FIGURE III.
Graph to show the approximate percentage occurrence of various pathological lesions in patients who had died under ethyl chloride anæsthesia.

some element of risk. In the remaining seven there was no contraindication.

Deaths Under Ether Sequence.

There have been during the ten years from 1919 to 1929 deaths numbering forty-three under ether sequence. By sequence is meant that initial induction has been effected by ethyl chloride, chloroform or the chloroform and ether mixture and the subsequent anæsthesia has been maintained with ether, given either by the open method or by the intratracheal or intrapharyngeal route.

The large number of deaths in the series is explained by the fact that ether sequence (and especially ethyl chloride-ether) is preeminently the most used routine anæsthetic method of today.

Details of the forty-three deaths are set out in Table VII and summarized in Table VI. In one or two patients a few minims of chloroform were given during induction, a fact which, though noted in the detailed table, is not held to have affected the course of anæsthesia.

TABLE VI.
Deaths under Ether Sequences.

Induction Stage.	Duration of Anæsthesia. Minutes. 5	10	15	20	25	30	35	40	45	50	55	60	65	155	Post-Anæsthetic Stage. Duration of Operation (Minutes).	Died Later (Minutes).
++	+	++†	+	+	+	+	+	+	+	+	+	+	+	+	2	90
++	+*		+	+		+						+			15	10
++				+								+			? 30	35
++				+											2	Immediate
++				+*											Induction	180
++															30	3
+*															150	45
															25	Immediate
															? 30	60

* Induction with chloroform, changing to ether before death.
† Induction with chloroform-ether mixture, changing to ether before death.

It is seen that deaths in the induction stage total eleven out of forty-three or approximately 25%. This compares favourably with chloroform anæsthesia, in the induction stage of which the mortality represents 50% of the deaths. The operations, too, are both longer and more serious than those of the chloroform series. If we omit the chloroform-ether and chloroform and ether mixture and ether

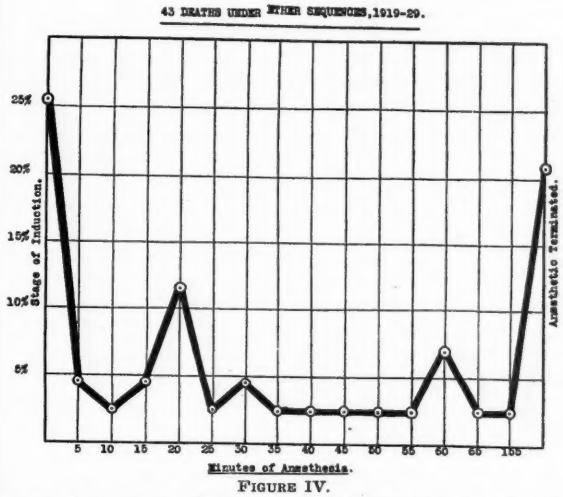

FIGURE IV.
Graph to show the approximate percentage of deaths at various periods in persons who had died under ether sequence anæsthesia.

43 DEATHS UNDER ETHER SEQUENCES,1919-29.

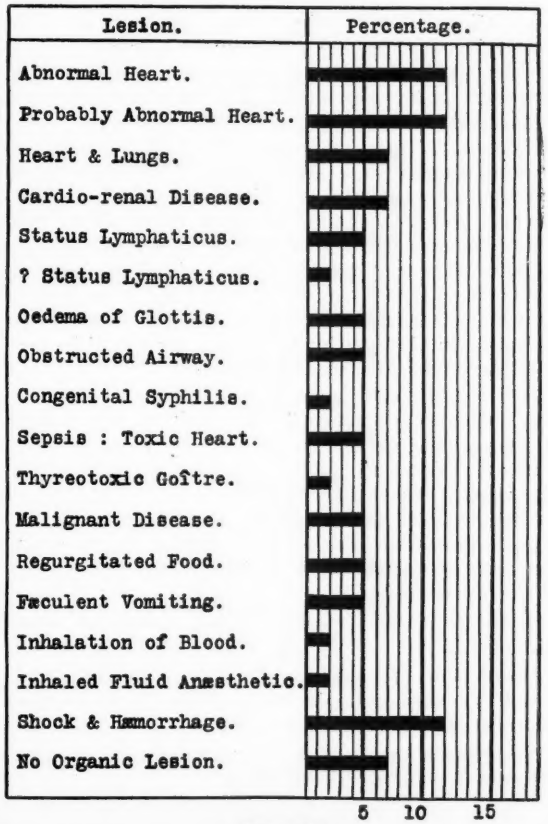

FIGURE V.
Graph to show the approximate percentage occurrence of various pathological lesions in persons who had died under ether sequence anæsthesia.

sequences, the number of deaths in the ethyl chloride-ether sequence becomes only seven or 16·3% for the induction phase.

Pathological Findings.

Evidence of a previously diseased heart existed in five patients (numbers 5, 10, 13, 17, 33 of Table VII). In a further five patients (numbers 6, 26, 38, 41, 42) more or less cardiac disease was probable such as would lower the patient's tolerance to an anæsthetic. In yet another three patients (numbers 16, 20, 36) there was associated renal involvement sufficient to justify classification as cardio-renal disease. Minor grades of renal damage were not infrequent in other patients, but were probably insufficient to exert any determining influence on the course of anæsthesia. In two patients (numbers 7, 29) cardiac involvement was associated with mild pulmonary tuberculosis, while in one (number 21) there was association of pulmonary disease with advanced cardiac disease.

The evidence seems to justify a diagnosis of *status lymphaticus* twice (numbers 12, 30) and in one additional patient this condition may have been present (number 37). I am unable to assess the significance of the enlarged thymus in number 38; obviously it exerted no influence in number 31. To what degree thymic enlargement indicates *status lymphaticus* is uncertain. I hesitate to make this diagnosis upon thymic enlargement alone.

Œdema of glottis was present in two patients (numbers 2, 22), the former as a result of adjacent sepsis, the latter as part of general anasarca.

Congenital syphilis was probably present in patient number 8. In number 7 cerebro-spinal syphilis was definitely diagnosed during life. Despite absence of *post mortem* signs there was reason to suspect that the myocardium was affected.

Definite toxic goître existed in one patient (number 28).

In two patients (numbers 23, 39) the airway was occluded, in the one by inflammatory swelling and in the other by cancerous infiltration.

Suffocation from fæculent vomiting was noted in two patients (numbers 9, 14) both of whom had intestinal obstruction.

Regurgitation of food resulted in the suffocation of two patients (numbers 3, 32).

The death of five patients (numbers 11, 18, 24, 25, 43) seems to have been primarily due to traumatic or operative shock rather than to the effect of the anæsthetic.

Suffocation by inhaled blood occurred once (number 35).

Insufflation of fluid anæsthetic into the lungs, followed by hæmorrhagic œdema of these organs, occurred in one patient (number 31).

No organic cause of death was detected in three patients (numbers 15, 19, 27).

Manner of Death.

Primary failure of the circulation was clinically observed in ten patients. Primary respiratory failure occurred in thirteen. In four no evidence existed whereby this point might be determined.

Secondary (suffocative) failure of respiration occurred in eight patients. In one other the heart appeared to have failed synchronously with the respiration. Insufficient evidence exists to enable me to determine which function was the first to be arrested. Primary synchronous failure of heart and respiration would seem to have occurred in six patients.

Choice of Anæsthetic.

There can be no doubt that two deaths (numbers 3, 31) were preventible. In the former a minor operation was attempted at an insufficient interval (less than two hours) after a full meal. In the latter fluid ether was pumped into the lungs, owing to overfilling by an attendant of an intratracheal ether apparatus.

One other death (number 32) may have been preventible as in number 3, which it resembles. It is possible, however, that the severity of the injuries necessitated an emergency operation and the taking of the risk.

One patient's death (number 35) cannot be assessed upon the known evidence, but intratracheal ether had been administered and the patient had had the cough reflex for fifteen minutes prior to returning to bed. Inhaled blood was found in the lungs, but what happened subsequently is unknown.

The possibility of having prevented the death of the remaining patients would depend largely upon the choice of anæsthetic agent. Opinion is widely divided in relation to the use of ethyl chloride as a means of inducing anæsthesia.[1] That its use in sequence involves more toxicity than that accompanying ether administered by the open method seems to be agreed, but it is still undecided whether the risk is greater than that associated with chloroform or chloroform and ether mixture and whether the risk is sufficient to debar it from routine use. Expressions of opinion are necessarily influenced by personal considerations. I may, however, sum up by saying that ethyl chloride, chloroform and chloroform and ether mixture should be employed in induction only if there be no apparent lowering of anæsthetic tolerance. By this criterion ether administered by the open method or, if available, gas and oxygen might have been preferred for twenty-three or more of the above forty-three patients. In one or two indeed a general anæsthetic of any kind would seem to have been a wholly unnecessary risk.

Conclusions.

There have been forty-three deaths under ether sequence anæsthesia during 1919-1929. Three inductions were effected with chloroform with subsequent change over to ether. One of these patients died in the induction stage. In one patient anæsthesia was induced with chloroform and ether mixture and later a change was made to ether. In thirty-nine patients the initial inducing agent was ethyl chloride. Ten

TABLE VII.

Deaths under Ether Sequences.

No.	Anæsthetic.	Sex.	Age.	Operation.	Died.	Failed First.	Heart.	Lungs.	Kidneys.	Other Organs.	General State.	Comment.
1	Ethyl chloride.	M.	21	Removal of Lane's plates.	Induction.	Respiration.	Much enlarged; very dilated, especially right side; tricuspid 7 fingers, mitral 4.	Congested.	Rather large, firm, congested, capsules adherent.	Congestion; sinus right femur.	Normal.	Right heart failure; heart dilated, ? from sepsis.
2	Ethyl chloride.*	M.	32	Incision abscess tongue.	90 minutes after operation over.	Respiration.	Normal; no lesion.	Very congested; inhaled blood.	Congested.	Congestion; tongue very swollen; œdema glottis.	Normal.	Suffocation from œdema glottis and inhaled blood; open ether safer.
3	Ethyl chloride.	M.	20	Suture wound knee.	10 minutes after operation over.	Respiration.	Enlarged, dilated; mitral 3, tricuspid 4.	Congested.	Congested, capsules adhering.	Congestion; meat impacted in the glottis.	Normal.	Suffocation by regurgitated food; preventible.
4	Ethyl chloride.	F.	59	Fulguration, malignant disease of bladder.	55 minutes.	Circulation.	Muscle pale, mottled, friable; coronaries patent, but sclerosed, especially left.	Pale, rather engorged.	Pale, firm, capsules adhering.	Carcinoma bladder, adrenal tumours.	Fair.	Left heart failure; heart affected by cancer and anæmia; open ether safer.
5	Ethyl chloride.	F.	18	Salpingectomy.	Induction.	Circulation.	Relaxed, dilated; tricuspid 4, mitral 3; streaks of aortic atheroma.	Congested.	Capsules adhering.	Pyosalpinx, pyometra, ovaritis.	Normal.	Syncope of previously dilated heart; unhealthy subject.
6	Ethyl chloride.	M.	64	Prostatectomy.	20 minutes.	Circulation.	Some hypertrophy and dilatation; mitral 4, tricuspid 5; right coronary dilated.	Emphysema.	Rather firm.	Congestion; liver friable.	Fair.	Cardiac syncope, probably abnormal heart; open ether safer.
7	Ethyl chloride.†	M.	37	Ununited fracture of forearm.	Induction.	?	Flabby, dilated; muscle rather pale and friable.	Congested; some tubercle bacillus right apex.	Congested.	Cerebro-spinal syphilis; on "914."	Normal.	Right heart failure, probably abnormal heart.
8	Ethyl chloride.†	M.	5	Cystoscopy.	40 minutes.	?	Left ventricle dilated; atheroma base of aorta; valves rather thickened; epicardium milky.	Congested.	Congested.	Congestion, cystitis.	Normal.	Right heart failure, abnormal heart; probably congenital syphilis.
9	Ethyl chloride.	F.	61	Intestinal obstruction; six days.	Nearly over; ? 30 minutes.	Respiration.	Flaccid; otherwise normal.	Congested; fæces in trachea and bronchi.	Normal.	Kinked gut.	Toxic heart, fæcal vomitus.	Suffocation by fæcal vomiting; every care; open ether better.
10	Ethyl chloride.	M.	56	Prostatectomy.	25 minutes.	Respiration.	Hypertrophy and dilatation; mitral 4.	Congested, friable.	Congested.	Congestion; malignant prostate.	Fair.	Right heart failure, abnormal heart; open ether safer.
11	Ethyl chloride.	M.	52	Fractured left leg, crushed body.	20 minutes.	Respiration.	Large; mitral 3; pale clot right ventricle and pulmonary artery.	Collapsed, especially left.	Bruising.	Retroperitoneal, left adrenal and pancreatic bruising.	Badly shocked.	Cardiac syncope, mainly from shock; open ether safer.
12	Ethyl chloride.	M.	3	Circumcision.	Induction.	Respiration.	Relaxed, very dilated; slight atheroma above one aortic cusp, epicardium thickened.	Congested posteriorly.	Congested.	Tonsils, thymus mesenteric glands and Peyer's patches enlarged; spleen lymphatic.	Normal.	Right heart failure; *status lymphaticus*.
13	Chloroform and ether, 1 : 2.	M.	76	Cholecystectomy.	? 10 minutes.	Respiration.	Fatty accumulation and infiltration; dilated; much aortic atheroma.	Slightly congested.	Normal.	Cholelithiasis.	Normal.	Failure abnormal and senile heart, with shock; open ether safer.
14	Ethyl chloride.	F.	65	Intestinal obstruction.	35 minutes.	Respiration.	Adherent pericardium; fibroid myocarditis; coronaries sclerosed.	Congested; fæces in trachea.	Fibrosed, capsules adhering, cortex reduced.	Mesenteric thrombosis.	Heart irregular, mitral systolic.	Suffocation by fæcal vomitus; desperately ill; open ether safer.
15	Ethyl chloride.	M.	38	Double inguinal hernia.	Induction.	Respiration and circulation.	Relaxed, dilated; muscle good; no lesion.	Congested.	Normal.	Normal.	Normal.	Cardiac dilatation and and failure; no organic lesion.

* Intratracheal administration of ether. † Taken a previous anæsthetic well.

TABLE VII.—*Continued.*

No.	Anæsthetic.	Sex.	Age.	Operation.	Died.	Failed First.	Heart.	Lungs.	Kidneys.	Other Organs.	General State.	Comment.
16	Ethyl chloride.	F.	65	Cholecystectomy.	15 minutes.	Respiration.	Relaxed, dilated; muscle good.	Congested.	Tough, congested, subgranular, capsules adhering.	Congestion; empyema of gall bladder.	Normal.	Right heart failure; mild renal degeneration.
17	Chloroform.	F.	16	Septum, tonsils, adenoids.	20 minutes.	Respiration.	Dilated; tricuspid 5, mitral 3; marked aortic atheroma.	Slightly congested.	Capsules adhering, very firm.	Glisson's capsule thickened; spleen, liver very firm.	Normal.	Probably abnormal heart; open ether safer, if heart diagnosible.
18	Ethyl chloride.†	F.	3½	Mastoid.	25 minutes; just over.	Circulation.	Normal.	Congested.	Normal.	Acute mastoiditis.	Normal.	Cardiac syncope; shock; no organic lesion.
19	Ethyl chloride.*	M.	29	Septum.	60 minutes after operation over.	Circulation and respiration.	Triesuspid 3, mitral 3; left ventricle slightly dilated and hypertrophied; some atheroma base aorta and left coronary.	Bases congested.	Congested.	Congestion.	Normal.	Cardiac syncope; no organic lesion; cocaine and adrenalin pack.
20	Ethyl chloride.	M.	65	Incision periurethral abscess.	15 minutes.	Circulation and respiration.	Relaxed, dilated, especially right side; tricuspid 5, mitral 3; muscle toxic and friable.	Bases congested.	Capsules adherent, fibrous, cysts right kidney.	Penis and scrotum infiltrated; stricture.	Pyrexial, mental, fæcal vomitus.	Right heart failure; uræmia; cardio-renal disease; bad risk; open ether safer.
21	Ethyl chloride.†‡	M.	31	Chronic empyema.	60 minutes.	Circulation and respiration.	Hard, relaxed, dilated; mitral 4, tricuspid 6; walls thin; adherent pericardium.	Left collapsed and adherent parietes.	Congested, capsules adhering.	Normal.	Normal.	Very abnormal heart; shock; open ether safer.
22	Ethyl chloride.	F.	34	Obstetrical forceps.	5 minutes.	Respiration.	Left ventricle slightly hypertrophied; right side dilated; mitral 2, tricuspid 5.	Normal.	Large, subgranular, capsules adhering.	Pregnant; œdema body; œdema of glottis.	Œdema and albuminuria.	Suffocation by œdema glottis; ethyl chloride risky.
23	Ethyl chloride.	M.	61	Incision retropharyngeal abscess.	Induction.	Respiration.	Hypertrophy and dilatation; pale clot apex left ventricle; coronaries thickened; some yielding of aortic valve attachments.	Emphysema, right lung adherent.	Large, firm, streaky, adherent capsules.	Liver congested; large retropharyngeal abscess.	Dysphagia; airways obstructed; bad risk.	Abnormal and toxic heart; open ether safer.
24	Ethyl chloride.	M.	60	Undoing gastroenterostomy.	Finished (2½ hours); died 45 minutes later.	Circulation.	Fair; aortic valves rather thickened, with some atheroma aorta and left coronary.	Left base congested, right emphysema.	Firm, capsules adhering.	Recently closed gastroenterostomy.	Regurgitant vomiting; very low.	Died from shock; heart fair for age; open ether safer.
25	Ethyl chloride.	M.	49	Empyema of gall bladder, peritonitis.	20 minutes.	Circulation and respiration.	Contracted; muscle good.	Congested, friable.	Normal.	Gallbladder drained; non-purulent peritoneal fluid.	Very low and collapsed.	Cardiac syncope; shock; peritonitis; open ether safer.
26	Ethyl chloride, tr. chloroform.	M.	60	Compound fracture of leg.	20 minutes.	Respiration.	Large, hard, dilated; tricuspid 5, mitral 4; some atheroma left coronary.	Congested.	Firm, capsules adhering.	Vomited fluid in stomach and airways.	Normal.	Right heart failure, probably unhealthy heart; open ether safer.
27	Chloroform.	M.	10	Tonsils, adenoids.	5 minutes.	Respiration.	Dilated; otherwise normal.	Normal.	Normal.	Adenoids very large.	Normal.	No organic lesion; chloroform not essential.
28	Ethyl chloride.†	F.	38	Exophthalmic goître, second stage.	Induction.	Circulation.	Flaccid; right side much dilated; dense fatty accumulation; muscle very thin; left ventricular wall very tough.	Slightly congested.	Congested, large, red, finely granular, capsules adherent.	Right lobe thyreoid removed; left lobe large, dense and fibrotic.	Anxious subject.	Right heart failure, cardiac degeneration; toxic goître; ethyl chloride risky.
29	Ethyl chloride.	M.	29	Hæmorrhoids.	Induction.	Circulation.	Large, relaxed, fatty accumulation; right side dilated; tricuspid 5; muscle good.	Much engorged; two small tuberculous nodes at right apex.	Large, tough, congested, cortex swollen.	Normal.	Pulmonary, second sound accentuated.	Right heart failure, probably abnormal heart; tuberculosis undiagnosed.
30	Ethyl chloride.	M.	13	Tonsils, adenoids.	Induction.	Circulation.	Contracted; patchy atheroma base aorta; muscle good.	Normal.	Tough.	Huge tonsils; large soft thymus; spleen tough; masses of ileocæcal glands.	Normal.	Cardiac syncope; *status lymphaticus*, † syphilis.

* Intratracheal administration of ether. † Taken a previous anæsthetic well. ‡ Intrapharyngeal administration of ether.

TABLE VII.—*Continued.*

No.	Anæsthetic.	Sex.	Age.	Operation.	Died.	Failed First.	Heart.	Lungs.	Kidneys.	Other Organs.	General State.	Comment.
31	Ethyl chloride.*	F.	27	Tonsils.	Induction; died 3 hours later.	Respiration.	Normal; slight atheroma aortic valves.	Acute hæmorrhagic œdema.	Normal.	Congestion; thymus persistent.	Normal.	Fluid ether pumped into lungs; wholly preventible.
32	Ethyl chloride.	M.	36	Amputation crushed forearm.	50 minutes.	Circulation and respiration.	Normal; no lesion.	Very congested; airways full of vomitus.	Congested, capsules adhering.	Congestion.	Mitral first sound reduplicated.	Suffocation by inhaled vomitus; preventible.
33	Ethyl chloride.	F.	7	Cerebral exploratory.	Nearly over, ? 60 minutes.	?	Well-marked atheroma aortic and mitral valves.	Pale, normal.	Normal.	Hydrocephalus; skull and ventricles expanded.	Believed to be cerebral tumour.	Cardiac syncope; death from shock; heart abnormal.
34	Ethyl chloride.	F.	40	Laparotomy.	65 minutes.	Circulation.	All cavities dilated; muscle pale, thin, friable.	Congested.	Secondary cancerous deposits.	Carcinoma of left ovary and descending colon; intestinal obstruction and secondary sepsis.	Normal.	Heart probably affected by cachexia; open ether safer.
35	Ethyl chloride.*	M.	37	Suture of lacerated head, face.	35 minutes after finish.	Respiration.	Enlarged; hypertrophy and dilatation; muscle good.	Greatly congested; inhaled blood in airways.	Congested.	Congestion; severe wounds head and face.	Alcoholic; otherwise normal.	Suffocation by inhaled blood; ? preventible.
36	Ethyl chloride.	F.	37	Obstetrical forceps.	30 minutes.	Circulation.	Hard, relaxed; mitral 3, tricuspid 4 right ventricle dilated, with clot in it; aorta and pulmonary artery.	Rather congested.	Rather friable, large, subgranular, capsules adhering.	Congestion; child head on perineum when died.	Normal.	Right heart failure; ? possibly early cardio-renal.
37	Ethyl chloride.*	F.	13	Radical mastoid.	155 minutes.	Respiration.	Right side rather dilated; tricuspid 4, mitral 2.	Congested.	Congested.	Thymus large and persistent; spleen lymphatic; mesenteric glands enlarged and one caseated.	Normal.	Right heart failure; shock; ? *status lymphaticus.*
38	Chloroform.	F.	19	Curettage.	Induction.	Circulation and respiration.	Right ventricle dilated, wall thin; left ventricle and valve orifices somewhat dilated.	Congested.	Normal.	Congestion; retained placenta; thymus large and persistent.	Normal.	Right heart failure, heart possibly abnormal; ? thymus.
39	Ethyl chloride.	M.	62	Repair of suicidal cut throat.	Induction.	Respiration.	Normal; left coronary narrowed.	Congested; inhaled blood in airways.	Large, firm, capsules adherent.	Malignant mass, tongue and epiglottis; glottis mere slit.	Resisted operation.	Suffocation by cancer of the glottis; open ether safer, if mass diagnosed.
40	Ethyl chloride.	M.	?	Incision quinsy.	Just over.	?	Relaxed, rather dilated; tricuspid 6, mitral 3.	Very congested.	Congested.	Large abscess right side.	Mitral systolic, ? toxic heart.	Suffocation and right heart failure; anæsthetic very risky.
41	Ethyl chloride.	M.	58	Compound fracture of leg.	3 minutes after finish.	Respiration.	Left side contracted; right side dilated; tricuspid 7.	Pale, emphysema.	Pale.	Severely shattered leg.	Heart sounds feeble; arteries calcified.	Right heart failure, probably abnormal heart; open ether safer.
42	Ethyl chloride.	M.	47	Dressing severe burns.	60 minutes.	?	Right side dilated; tricuspid 6; slight atheroma base of aorta and left coronary.	Congested.	Firm; numerous patches of superficial atrophy.	Congestion; septic burns, buttocks, etc.	Rapid pulse; pyrexia.	Right heart failure, possibly abnormal heart; sepsis; shock; open ether safer.
43	Ethyl chloride.	M.	45	Compound fracture of leg and arm.	45 minutes.	Respiration.	Rather large; no lesion.	Congested.	Fairly normal.	Superficial tear right lobe liver.	Alcoholic; severely shocked.	Death from shock; open ether safer.

* Intratracheal administration of ether.

of the thirty-nine deaths were in the induction stage. Organic disease likely to lower the tolerance of the patient to an anæsthetic existed in thirty-one patients out of forty-three. In five death was probably due to shock. In three no organic lesions were found *post mortem*. Two deaths appear to have been definitely preventible. Two others were possibly so. In a considerable number of instances it might have been better had ether administered by the open method been the only anæsthetic agent.

Deaths Under Ether Administered by the Open Method.

Ether administered on a mask was responsible for twenty-two deaths brought to inquest during 1919-1929. In general ether by the open method without a preliminary inducing agent is reserved for patients in whom it is anticipated that the anæsthetic tolerance is lowered. This accounts for the smaller number of deaths than under ether sequence; the records include a smaller number of administrations. The average age of the patients is also greater in this than in the ether sequence series, namely forty-five as compared with thirty-eight.

A general summary of the ether series is made in Table VIII and full details are found in Table IX.

TABLE VIII.

Deaths under Ether administered by the Open Method.

Induction Stage.	Duration of Full Anæsthesia. Minutes. 5	10	15	20	30	40	50	Post-Anæsthetic Stage. Duration of Operation (Minutes).	Died Later (Minutes).
+†								Long§	Soon
+*†	+†	+	+†	+	+§	+§	+	70	Soon
+†	+		+		+‡			10	5
+					+			Long	60
+					+			20	10

* Few drops chloroform, insufficient to affect result.
† Previous successful anæsthetic.
‡ Anæsthesia maintained with intratracheal ether.
§ Anæsthesia maintained with intrapharyngeal ether.

It is seen that deaths in the induction stage total five or 22·7% of the whole. This is lower than the 50% induction death rate for chloroform and the 25% for all ether sequences, but is higher than the 16·3% of ethyl chloride-ether. It is curious to note from Tables VII and IX that the patients who died during ether anæsthesia administered by the open method and during anæsthesia with ethyl-chloride-ether in the induction phase, were not obviously ill.

Pathological Findings.

In two patients (numbers 8 and 22) definite cardiac disease was likely to lower anæsthetic tolerance. In both, however, there was a considerable element of operative shock and prostration from grave illness. In one patient (number 12) there was evidence of possible preoperative cardiac disease and in addition enlargement of thyreoid and thymus was detected, though no evidence existed that either *status lymphaticus* or toxic goître was present. In three (numbers 7, 19 and 21) there is evidence of combined cardiac and renal disease.

The diagnosis of *status lymphaticus* seemed to be justified in patient number 3 whose heart seems to have been abnormal.

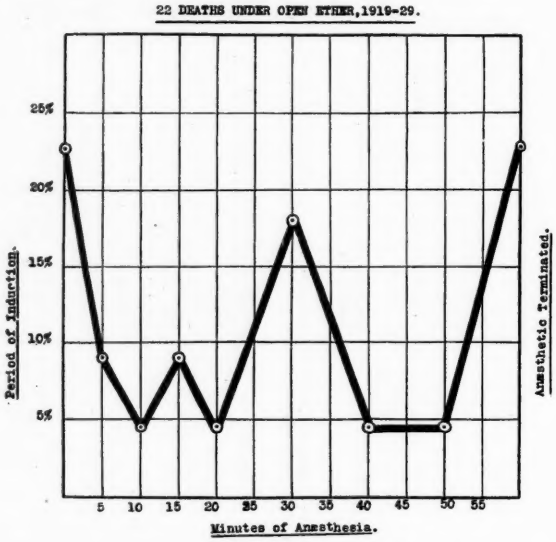

FIGURE VI.

Graph to show the approximate percentage of deaths at various periods in persons who have died under ether anæsthesia administered by the open method.

Congenital syphilis may have been present in one patient (number 13).

In three patients (numbers 2, 17, 18) death seems to have been due to failure of a heart made toxic by severe sepsis, peritonitic in the first and septicæmic in the other two.

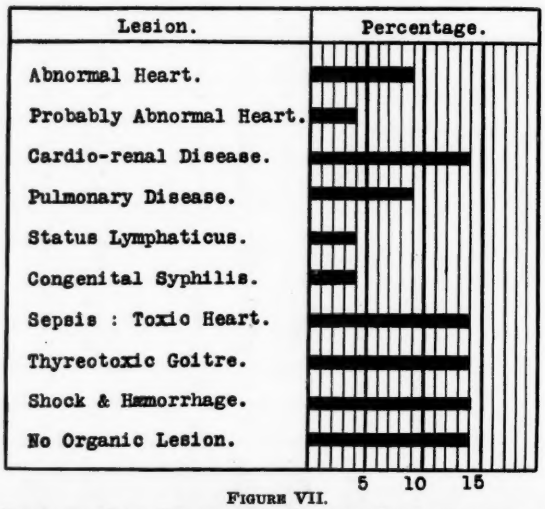

FIGURE VII.

Graph to show the approximate percentage occurrence of various pathological lesions in persons who have died under ether anæsthesia administered by the open method.

TABLE IX.

Deaths under Open Ether.

No.	Sex.	Age.	Operation.	Died.	Failed First.	Heart.	Lungs.	Kidneys.	Other Organs.	General State.	Comment.
1	F.	40	Exophthalmic goitre.	5 minutes.	Respiration.	Relaxed; muscle fair.	Congested.	Normal.	Normal.	Acute onset; pulse 136; bilateral thyreoid swelling; thymus large.	Failure of thyreo-toxic heart; ? rôle of persistent thymus.
2	M.	64	General peritonitis after appendix.	A few minutes after end of long operation.	Circulation and respiration.	Enlarged; muscle rather swollen; right side overlaid and infiltrated fat.	Congested; some vomitus in airways.	Firm, subgranular, capsules adhering.	Acute inflammation of and around small gut; appendix removed.	Fæculent vomiting; bad risk.	Right heart failure, probably toxic heart; ?rôle played by vomitus in airways.
3	F.*†	11	Tonsils, adenoids.	Induction.	Circulation.	Relaxed, dilated; tricuspid 5, mitral 3; cavity left ventricle much dilated; atheroma base aorta and mitral valve flap.	Congested; some inhaled blood.	Congested.	Tonsils large; thymus persistent; spleen lymphatic; mesenteric glands enlarged.	Nervous subject; otherwise normal.	Right heart failure; probably *status lymphaticus*.
4	F.‡	44	Tonsils.	Soon after end of 70-minutes operation.	Circulation.	Right side much dilated; tricuspid 6; left side normal.	Congested; some inhaled blood.	Tending to granularity, capsules adhering.	Congestion.	Normal.	Right heart failure; no definite organic lesion.
5	M.	35	Perforated gastric ulcer.	Mainly had local anæsthetic; under general anæsthetic 10 minutes; given stomach wash out and died 5 minutes later.	Respiration.	Contracted.	Congested.	Normal.	Pyloric ulcer.	Condition low.	Cardiac syncope; no organic lesion; death probably from shock.
6	F.†	70	Entero-anastomosis.	15 minutes.	Respiration.	Muscle fair; large, flabby, dilated; fatty accumulation.	Hypostatic engorgement.	Pale, firm.	Entero-anastomosis.	Partial gastrectomy five days before; very low; regurgitant vomiting.	Failure possibly abnormal heart, or ? shock.
7	F.†	32	Dental extractions.	Induction.	Circulation.	Relaxed, dilated; tricuspid 5, mitral 4; right ventricular wall thin; mitral flap thickened.	Congested; right engorged with fluid.	Congested, friable, tending to granularity, capsules adherent.	Normal.	Normal.	Failure of apparently rather abnormal heart; ? cardio-renal changes.
8	M.	50	Cholecystitis, local peritonitis.	Died 1 hour after end of long operation.	Circulation.	Large, relaxed; pale clot in ventricles, especially right; marked syphilis disease aorta, and occlusion right coronary.	Right adherent, left flabby.	Normal.	Normal.	Condition low; slightly cyanosed; ? missed heart-beats.	Failure of abnormal and syphilitic heart under operative shock; syphilitic aortitis; bad risk.
9	M.	38	Nasopharyngeal tumour.	Induction.	Respiration.	Relaxed, dilated, especially right side; muscle good.	Congested; some inhaled blood; patchy adhesions right.	Normal.	Tumour blocking left posterior nares.	Normal.	Right heart failure; no organic lesion.
10	F.†	33	Incision breast abscess.	Induction.	Respiration.	Flabby, dilated; muscle normal.	Slightly congested.	Normal.	Breast abscess.	Normal.	? Some toxicity from abscess; no definite organic lesion.
11	F.‡	55	Exophthalmic goitre.	30 minutes.	Circulation.	Dilated; muscle good.	Congested; adhesions.	Normal.	Thyreoid generally enlarged.	Heart enlarged; pulse 150.	Failure of heart; probably affected by goitre.
12	F.	49	Hæmorrhoids, myomata.	20 minutes.	?	Large; fatty accumulation but no degeneration; all cavities dilated.	Slightly congested.	Normal.	Myomata; thyreoid very large; thymus persistent, large and fleshy.	Heart rather enlarged; mitral systolic bruit.	Probably abnormal heart; probably not *status lymphaticus*; ? was thyreoid toxic.

* Few drops chloroform; insufficient to effect result.
† Taken previous anæsthetic successfully.
‡ Anæsthesia maintained by intrapharyngeal ether.

TABLE IX.—*Continued.*

No.	Sex.	Age.	Operation.	Died.	Failed First.	Heart.	Lungs.	Kidneys.	Other Organs.	General State.	Comment.
13	F.§	34	Tuberculous glands of neck.	40 minutes.	?	Relaxed; left ventricle rather dilated; surface rather milky; commencing atheroma mitral flap and aorta.	Rather congested.	Normal.	Tuberculous glands, both sides of neck.	Normal.	Failure of an abnormal heart; ? congenital syphilis.
14	F.†	33	Post-operation ileus.	10 minutes.	Circulation and respiration.	Relaxed; muscle swollen-looking; pale whipped-out clot in ventricles.	Congested; some inhaled vomitus.	Firm, tending to granularity, capsules adherent.	Paralytic ileus of lower coils of ileum.	Subtotal hysterectomy for myomata, previous day; very low.	Cardiac failure in very sick patient; mainly shock.
15	M.	55	Abscess of lung.	5 minutes.	Respiration.	Small, globular; normal.	Right gangrenous abscess; left areas of broncho-pneumonia.	Some superficial areas of degeneration.	Normal.	Desperately sick.	Cardiac syncope; toxæmia from gangrene of lung; bad risk.
16	F.	45	Thoracotomy; ? empyema.	Operation lasted 20 minutes; died 10 minutes later.	?	Fairly normal.	Left lung wholly consolidated; clot in bronchi; clot in right main bronchus, and inhaled blood.	Normal.	Normal.	Pulse 110; condition fair.	Cardiac syncope from pneumonic toxæmia and shock.
17	F.	41	Curettage.	Induction.	?	Muscle swollen; toxic.	Engorged.	Large, swollen, friable, subgranular, adherent capsules.	Perforated uterus from septic abortion; septicæmia.	Septicæmic; very ill.	Failure of toxic heart in septicæmia.
18	F.	38	Septic myoma.	15 minutes.	Respiration.	Relaxed; muscle swollen; pale clot right side.	Engorged with fluid.	Swollen slightly granular, capsules adherent.	Septic myoma; septicæmia.	Pyrexial; respirations 40 minute; very toxic.	Syncope of toxic and septicæmic heart.
19	F.	69	Nephrolithotomy.	30 minutes.	Circulation.	Large, flaccid, dilated; thick fatty accumulation and infiltration; muscle pale, friable.	Engorged with fluid.	Intensely engorged, soft, blood cysts, capsules adhering.	No renal calculus seen.	Obese; enlarged heart.	Failure abnormal heart; probably cardio-renal degeneration.
20	F.‡	50	Exophthalmic goitre.	30 minutes.	Circulation.	Slight dilated; mitral 3, tricuspid5 slight atheroma aorta; slight coronary sclerosis.	Slightly congested.	Large, red, granular, capsules adhering.	Thymus persistent; spleen lymphatic.	Very bad risk.	Cardiac failure; toxic goitre; ? rôle of enlarged thymus and renal condition.
21	M.	65	Suture of wounds, neck and mouth.	30 minutes.	Respiration.	Very flabby, relaxed, dilated; left coronary calcified and obstructed.	Engorged posteriorly.	Firm, subgranular, adherent capsules.	Lacerated tongue, jaw, neck and mouth.	Heart-sounds faint.	Failure of probably abnormal heart; ? cardio-renal disease.
22	M.	62	Ruptured spleen.	50 minutes.	Respiration.	Adherent pericardium; very ? dilated; muscle degenerate and friable; atheroma aorta.	Flabby; patchy adhesions.	Granular, friable.	Recent splenectomy.	Exsanguinate; auto-transfusion attempted during operation.	Failure of grossly abnormal heart.

† Taken previous anæsthetic successfully.

‡ Anæsthesia maintained by intratracheal ether.

§ Anæsthesia maintained by intrapharyngeal ether.

Toxic goître seems to have been the determining factor in three deaths (numbers 1, 11, 20).

In two patients (numbers 15, 16) gross lesions of the lung existed likely to lower anæsthetic tolerance.

In three patients (numbers 5, 6 and 14) shock seems to have been the probable cause of death, the preoperative condition of the patient having been very low in each.

No organic lesion to account for death could be found in three records (numbers 4, 9 and 10), toxæmia from the breast abscess in number 10 being scarcely sufficient to justify a diagnosis of impaired myocardial function.

Manner of Death.

Primary circulatory failure seems to have occurred seven times and primary respiratory failure nine times. Failure of pulse and respiration seems to have been synchronous in two patients. In four the evidence does not exist whereby the point might be decided.

Choice of Anæsthetic.

Ether applied on a mask is, after gas and oxygen, generally regarded as the safest of general anæsthetic agents. In the above series no absolute contraindication to its use seems to have existed. Certainly some of the operations might have been performed under local anæsthesia, but assuming that a general anæsthetic was indicated, no safer choice of anæsthetic than ether by the open

method could have been made. As gas and oxygen anæsthesia is only now entering into extended general use and its employment even in public hospitals is a matter of recent years, it is scarcely just to criticize the results from this standpoint, other than to suggest that nowadays gas and oxygen would have been selected *inter alia* for the two patients with toxic lung affections.

Ether administered by the open method was responsible for twenty-two deaths during 1919-1929. In probably sixteen of the patients organic disease existed which was likely to lower the tolerance to a general anæsthetic. In three persons death was probably due to operative shock. In three no organic cause for death was recorded in the *post mortem* notes. In no instance was ether by the open method directly contraindicated. Apart from the modern vogue of gas and oxygen or the alternative use of local anæsthesia, the choice of anæsthetic agent was the safest possible. In no instance does evidence appear to have existed that death was directly preventible.

Deaths Under Nitrous Oxide and Oxygen.

Only five deaths of persons who were anæsthetized by nitrous oxide and oxygen, have been brought to inquest during the ten years from 1919 to 1929. In many instances presumably the anæsthetic was but an additional factor in a case of great gravity and therefore no inquest was ordered.

It is noteworthy that no death under ethylene and oxygen has come to inquest during the above period. In one metropolitan hospital alone seven deaths have been recorded since 1925. Presumably again the patients were so ill that an inquest was held unnecessary.

Details of nitrous oxide and oxygen deaths are fully set out in Table X and may be summarized thus: During the induction phase there was one death; after the operation had been proceeding for fifteen minutes there were two deaths; after the operation had been proceeding for thirty minutes there was one death; after the operation had been proceeding for about sixty minutes there was one death.

Pathological Findings.

Some evidence of cardiac disease existed in four of the five patients (numbers 1, 2, 4, 5 of Table X). In no instance, however, was the cardiac lesion the decisive factor in causing death. Other conditions existed which were likely to render anæsthesia in each of these persons a very grave danger.

Toxic goître was present in one patient (number 1). The condition of the heart appears to have been associated with thyreotoxicosis. There was in addition a persistent thymus, but this does not constitute evidence of *status lymphaticus*.

One patient (number 2) was suffering from malignant disease; there was in addition evidence of an abnormal and probably senile heart. The cachexia from the cancerous stricture of the colon must be also reckoned in part as the cause of death.

TABLE X.

Deaths under Nitrous Oxide and Oxygen.

No.	Sex.	Age.	Operation.	Duration.	Failed First.	Heart.	Lungs.	Kidneys.	Other Organs.	Pre-operative Condition.	Comment.
1	F.	49	Exophthalmic goître.	30 minutes.	Circulation.	Slightly enlarged; some hypertrophy left ventricle; muscle good.	Slightly engorged.	Rather firm; capsule stood to adhere.	Liver congested; thyreoid partly removed; thymus persistent and fleshy.	Fair; mitral systolic bruit.	Failure of heart, probably toxic from goître; rôle of thymus indefinite.
2	M.*	74	Carcinoma sigmoid (second stage).	15 minutes.	Circulation and respiration.	Patchy pericardial adhesions; muscle dense fibrous; rather sclerosed and tortuous coronaries.	Hypostatic congestion bases; tuberculous scars right apex.	Normal.	Cancerous stricture of sigmoid colon.	Very low; irregular and intermittent pulse.	Failure of abnormal heart in probably cachectic and senile patient.
3	F.*	19	Subphrenic abscess.	Induction.	Respiration.	Normal.	Normal.	Normal.	Subphrenic abscess; partly drained pelvic abscess.	Desperately ill; almost moribund.	Syncopal death after septic abortion and pelvic and subphrenic abscess.
4	F.	36	Ruptured ectopic.	15 minutes.	Circulation and respiration.	Enlarged, dilated, overlaid with fat; tricuspid orifice 6 fingers, mitral 4.	Pallor.	Smooth, pale and friable.	General pallor; ruptured right tubal pregnancy.	*In extremis.*	Death mainly from hæmorrhage and shock.
5	M.†	40	Hæmorrhaging duodenal ulcer.	? 60 minutes.	Respiration.	Rather large; muscle fair; slight aortic atheroma.	Engorged with fluid.	Granular, contracted, calculi; right hydronephrosis.	General pallor; recent gastro-enterostomy; large and small gut full of altered blood, wound being sutured when died.	Very anæmic; bad risk.	Death mainly due to hæmorrhage and shock.

* Had taken a previous anæsthetic successfully.

† Had changed to open ether shortly before death.

One patient (number 3) suffered from pelvic and subphrenic abscesses and was in so toxic a condition as to be almost moribund at the time of induction, in which phase death occurred.

One patient (number 4) seems to have died mainly from shock and the hæmorrhage of a ruptured ectopic pregnancy. The heart was apparently also abnormal.

One patient (number 5) seems to have died mainly from operative shock and hæmorrhage from a duodenal ulcer rather than from the effect of the anæsthetic.

Manner of Death.

Primary circulatory failure was observed clinically in one patient and primary respiratory failure in two. In the other two the heart and respiration seem to have failed simultaneously.

Choice of Anæsthetic.

It would be difficult to imagine a safer general anæsthetic than nitrous oxide and oxygen. Assuming that local anæsthesia was unsuitable, the safest anæsthetic agent was selected. Two patients (numbers 3 and 4) were *in extremis* and operation was undertaken as a last resort. Two others (numbers 2 and 5) seem to have been very bad risks. The patient with toxic goître (number 1) did not seem to be very ill before the operation, but the risks of anæsthesia in this condition need no elaboration.

Conclusions.

Nitrous oxide has accounted for five deaths during the period from 1919 to 1929. One death of an almost moribund patient occurred during the induction stage. The other four patients were all very bad anæsthetic risks. As a general anæsthetic was necessary, nitrous oxide and oxygen was the safest possible choice.

Deaths Under Local Anæsthetics.

Inquests into the causes of death of persons undergoing operations with local anæsthesia numbered eight in the period from 1919 to 1929, a figure which may seem high even in relation to the large number of local anæsthetics administered, until it is seen that cocaine, which bears an ill reputation in this respect, was employed no less than five times out of the eight. The individual details are grouped in Table XI and are given in detail in Table XII.

Pathological Findings.

In four persons (numbers 2, 4, 6, 8 of Table X) definite organic cardiac disease seems to have been present. In number 2 there was in addition enlargement of thyreoid and thymus, but the toxicity or otherwise of the former cannot be determined and the latter did not constitute *status lymphaticus*.

Renal disease was definitely present in one patient (number 5).

No organic cause for death existed in three patients (numbers 1, 3, 7).

TABLE XI.
Deaths under Local Anæsthetics.

No.	Anæsthetic.	Operation.	Stage at which Death Occurred.
1	Cocaine, 5%.	Cystoscopy.	Not begun.
2	Cocaine, 1%; adrenalin.	Tonsillectomy.	Not begun.
3	Cocaine, 0·3%.*	Dental extractions.	Three teeth removed.
4	Cocaine, 0·03 g.; adrenalin, 1/10000.	Excision of sebaceous cyst.	Not begun.
5	Cocaine.	Dental extractions.	Not begun.
6	"Novocain," 0·015 g.	Incision of quinsy.	Just begun.
7	"Stovaine," 4%; intraspinal.	Induction of labour.	10 minutes from start.
8	β eucaine, 1%; adrenalin.	Excision of tumour of abdominal wall.	Proceeding.

* Previous successful local anæsthesia.

Manner of Death.

Primary respiratory failure occurred once; primary circulatory failure four times. In three instances the mode of death could not be determined on the evidence.

Choice of Anæsthetic.

It is axiomatic never to use a general anæsthetic when a local one will serve as well. At the same time the above series serves to point out again that even local anæsthesia carries a certain element of risk, due apparently to the cardio-depressant activities of the group. Cocaine has the worst reputation in this respect and it is perhaps not an accidental occurrence that the three patients in whom no organic lesion was discovered, had all been anæsthetized with cocaine. Intraspinal administration of drugs so diffusible has also a higher danger rate than appertains to local infiltration, though in the case above particularized (number 5) there was gross renal dysfunction. In the rest of the series the heart was abnormal and therefore possibly more vulnerable to the depressing effect of this group of drugs.

Conclusions.

Local anæsthesia has accounted for eight deaths between 1919 and 1929. Of the patients five possessed gross organic disease likely to lower their tolerance to the anæsthetic agent. Five deaths occurred under cocaine; no organic lesion existed capable of accounting for three of the deaths. In the remaining three persons in whom "Novocain," β eucaine and "Stovaine" respectively were injected, definite cardiac or renal disease was present.

Self-Administered Anæsthetics.

As curiosities of anæsthesia reference may be made to two instances in which the anæsthetic drug was apparently self-administered.

A woman of apparently unstable mentality was found dead in bed, having imbibed a quantity of a fluid containing alcohol and ether. These substances were identified by analysis of the stomach contents. By the bed stood a vessel containing a fluid which

TABLE XII.

Deaths under Local Anæsthetics.

No.	Sex.	Age.	Anæsthetic.	Operation.	Duration.	Failed First.	Heart.	Lungs.	Kidneys.	Other Organs.	General Condition.	Comment.
1	M.	43	Cocaine, 5%.	Cystoscopy.	Not begun.	Respiration.	Right side dilated; nothing abnormal.	Greatly congested.	Normal.	Urethral stricture.	Normal.	Right heart failure; no organic lesion.
2	F.	54	Cocaine, ½%.*	Dental extractions.	Three teeth removed.	Circulation.	Large, flabby, dilated; muscle tough; coronaries thickenedbutnotoccluded.	Congested.	Firm.	Thyreoid enlarged; thymus large and persistent.	Cardiac decompensation and œdema.	Failure of abnormal heart; rôle of thyreoid uncertain; not *status lymphaticus*.
3	M.	31	Cocaine, 1%; adrenalin.	Tonsils.	Not begun.	Circulation.	Relaxed, dilated, especially right side; muscle, valves, etc., normal.	Intensely engorged.	Congested.	Congestion.	Normal.	Right heart failure; no organic lesion.
4	F.	8	"Novocain," gr. ½.	Incision quinsy.	Proceeding.	?	Rather large; some hypertrophy and dilatation left ventricle; aortic valves thickened, contracted and loosened from attachments.	Slightly engorged.	Congested.	Congestion; right quinsy; spleen lymphoid, but no evidence of *status lymphaticus*.	Recognized congenital heart disease.	Failure of abnormal heart.
5	F.	26	"Stovaine," 4%; intraspinal.	Induction of labour.	10 minutes.	?	Contracted; normal.	Left pleural effusion; basal collapse; slight effusion right.	Firm, subgranular in parts, capsules adhering.	Membranes ruptured; *os* partly dilated.	Œdema; albuminuria; chronic Bright's disease.	Medullarycentralfailure; chronic renal disease.
6	M.	30	Cocaine, gr. ½; adrenalin.	Excision sebaceous cyst.	Not begun.	Circulation.	Enlarged, dilated; mitral5, tricuspid 6 fingers; slight atheroma aorta, left coronary.	Congested.	Smooth, congested, capsules adherent.	Congestion.	Normal.	Right heart failure; abnormal heart.
7	F.	38	Cocaine.	Dental extractions.	Not begun.	?	Left side contracted, empty; right side dilated.	Congested.	Congested.	Congestion.	No data available.	Right heart failure; no organic lesion.
8	M.	29	Eucaine, 1%; adrenalin.	Excision tumour abdominal wall.	Proceeding.	Circulation.	Dilated; tricuspid 7–8, mitral 4; slight aortic atheroma.	Congested; hæmorrhagic.	Congested.	Congestion.	Known cardiac inefficiency.	Right heart failure; abnormal heart.

* Previous successful local anæsthetic.

on analysis revealed 27% alcohol, 5% ether, water and an essential oil resembling oil of aniseed. *Post mortem* examination disclosed an odour of ether, a small contracted heart, injected airways and lungs very gorged and smelling of ether. Death was presumably due to suffocation by an overdose of ether taken by mouth.

In the other case a young girl had stolen a bottle of chloroform from a certain doctor's surgery. She was subsequently found dead in a public garden, having a pad of wool and calico bound over her mouth and nose and chin. The pad smelt of chloroform and the empty drop bottle lay near by. At the *post mortem* examination there was an odour of chloroform about the viscera and the analysis of the stomach, lungs and liver gave a positive reaction for this drug. The heart was small and healthy, the trachea reddened and the lungs congested and engorged with fluid. Death was presumably due to suffocation by inhaled and swallowed chloroform.

Summary of Pathological Changes.

Certain difficulties are encountered in determining the pathological changes for the following reasons. The *post mortem* findings were not ascertained by the one pathologist with the result that the criteria applied are not necessarily quite the same. In analysing the findings I have no first hand acquaintance with the facts of each case. I am therefore compelled to rely exclusively on the evidence available. The assessment of pathological changes, of anæsthetic risk and of suitability of anæsthetic agent becomes very often a matter of personal experience only. Pathological examination cannot be expected to reveal abnormalities of function.

However, whilst recognizing that more than one lesion may coexist in the one patient, an attempt has been made to classify the primary or major pathological conditions likely to affect tolerance to an anæsthetic (see Table XIII).

A brief review of the detailed tables will show that in the great majority the heart was primarily or secondarily diseased. It is by the recognition of this possibility that the anæsthetic mortality may be greatly reduced. Very few deaths were frankly preventible, as was the case when fluid ether was pumped into the lungs or when an anæsthetic was administered too soon after a meal. In certain instances the choice of anæsthetic agent would seem to have been inadvis-

able, even dangerous, though, of course, one cannot be aware of the particular problem encountered in the past by the anæsthetist.

TABLE XIII.

Pathological Findings.

Pathological Condition Found.	Ethyl Chloride.	Chloroform.	Ether Sequences.	Open Ether.	Nitrous Oxide and Oxygen.	Local Anæsthesia.	Total for Each Lesion.
Abnormal heart	2		5	2		4	13
Probably abnormal heart		4	5	1			10
Heart and lungs			3				3
Cardio-renal disease		6	3	3		1	13
Cardio-renal and lungs	1						1
Status lymphaticus	2	1	2	1			6
? *Status lymphaticus*	1		1				2
Œdema of glottis	1		2				3
Obstructed airway			2				2
Congenital syphilis	1		1	1			3
Sepsis; toxic heart		2	2	3	1		8
Thyreotoxic goître		1	1	3	1		6
Malignant disease		2	2		1		5
Cerebral tumour		1					1
Regurgitated food			2				2
Fæculent vomiting			2				2
Inhalation of blood			1				1
Inhaled fluid anæsthetic			1				1
Operative shock; hæmorrhage			5	3	2		10
No organic lesion	1	1	3	3		3	11
Disease of lungs				2			2
Total Number of Administrations	9	18	43	22	5	8	105

SUITABILITY OF ANÆSTHETIC.

(Local Anæsthesia assumed Unsuitable).

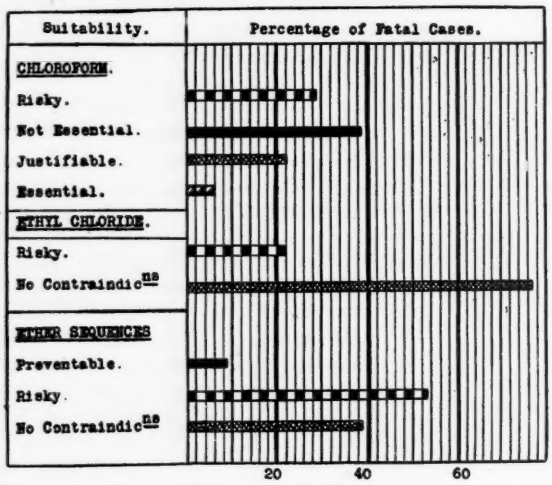

FIGURE VIII.

Graph, expressed in approximate percentages, showing the suitability or otherwise of the anæsthetic agent chosen in fatalities occurring under chloroform, ethyl chloride and ether sequence anæsthesia. Ether administered by the open method and nitrous oxide-oxygen are omitted, as being, if local anæsthesia is unsuitable, the best possible choice.

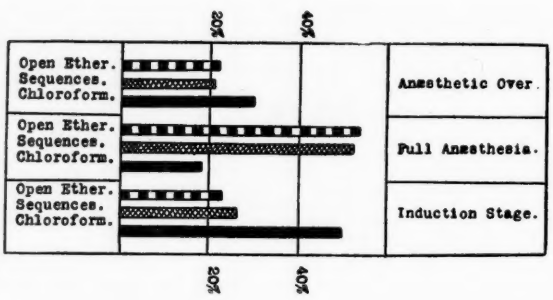

FIGURE IX.

Graph, expressed in approximate percentages, comparing the number of fatalities at various stages of anæsthesia with chloroform, ether administered by the open method and ether sequences. Note the high figure (50% of the deaths under that drug) in the induction stage of chloroform anæsthesia.

SUMMARY OF PATHOLOGY, 105 CASES.

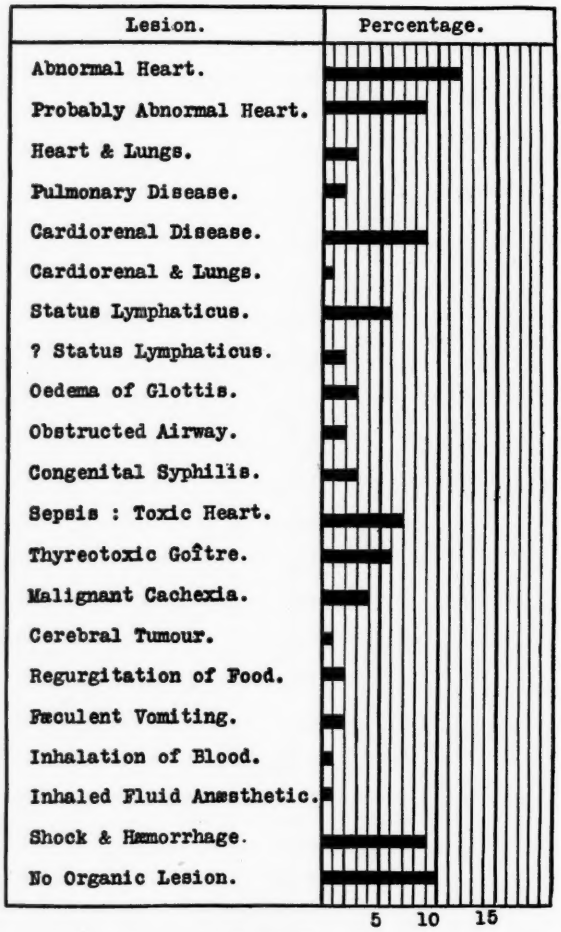

FIGURE X.

Graph to show the approximate percentage occurrence of various pathological lesions in 105 persons who died during anæsthesia.

Final Conclusion.

The final conclusions may be set out as a series of recommendations, embodying no new principles, but perhaps justifiable in that neglect of each one of the following precautions has been associated with a death in the series of deaths presented.

1. Every general anæsthetic involves a small but definite risk, of the order of perhaps 1·3 per 1,000, and therefore should not be undertaken lightly nor when a local anæsthetic would serve as well.

2. Even local anæsthetics have a mortality rate, cocaine being the worst offender. This should be remembered in selecting the drug, its dosage and the route of administration.

3. Selection of the safest anæsthetic which will fulfil the requirements, is important and error, if any, should be on the side of safety rather than of convenience.

4. The induction phase should never be hurried nor when low tolerance is suspected should a more toxic drug be employed for the sake of speed or convenience. Neither a long induction nor an impatient surgeon should tempt the anæsthetist to neglect this factor.

5. It is important to assess the tolerance of the patient to a general anæsthetic in general and in particular.

6. The patient's stomach must be empty.

7. Patency of airways is all important and an impaired airway makes all anæsthesia more risky and contraindicates ethyl chloride and chloroform however convenient they may appear to be.

8. It is essential that mechanical anæsthetic apparatus should be examined before use by the anæsthetist in person and not left to an attendant.

9. The recovery stage requires careful watching by the anæsthetist or by a reliable and responsible deputy.

10. In conclusion a plea is made for the carrying of the research spirit yet more fully into the routine administration of anæsthetics. An anæsthetic, since it involves some risk, is surely worthy of separate and individual mention in the records of both private anæsthetists and public institutions. The keeping of a detailed and cross indexed anæsthetic register in our big hospitals, analogous to the operation registers of the operating theatres, should appeal to every anæsthetist who loves his calling, and would doubtless provide data most helpful in the elucidation of our anæsthetic problems.

Acknowledgement.

I desire to express my thanks to the City Coroner of Melbourne and to the Secretary of the Crown Law Department for permission to make use of the official depositions, to the officers of these two departments for their unfailing courtesy and assistance in searching for data, to Dr. C. H. Mollison, Pathologist to the Coroner at Melbourne, who has generously made available the whole of his recorded pathological findings, to the Superintendent of the Melbourne Hospital, Dr. Cooper, for information supplied and lastly, but not least, to Dr. F. H. Green for many helpful suggestions.

Reference.

(1) G. Slot: "Deaths Under Anæsthetics with Special Relations to Their Pathology," *Proceedings of the Royal Society of Medicine*, Volume XXII, 1929, page 901.

Reviews.

THE CENTRAL NERVOUS SYSTEM.

WHILE many large text books on anatomy contain excellent diagrams illustrating both simple and complicated pathways in the central nervous system *et cetera*, the ready welcome given Herrick's "Introduction to Neurology" seems to show the want of a smaller volume presenting this information.

The ordinary student in anatomy usually made excerpts from several larger reference text books with coloured ink to help his memorizing and assist his reading and the older student, candidate for the diploma in psychiatry, will have found many old conceptions modified by the time he reads for special examinations. What he wants appears to be a sort of illustrated dictionary with each concept, in this case an impulse pathway in the central nervous system, boldly if diagrammatically outlined in colours with the briefest description in the text. In "An Introduction to the Study of the Nervous System" Hewer and Sandes seem to have hit on quite the right idea.[1]

Within the compass of one hundred pages in clear type they discuss the neurone histologically and pathologically, proceeding to the study of spinal and the cerebellar tracts, basal ganglia and cranial nerve connexions. A short *résumé* of the microscopical structure of the cortices together with a necessary description of the cerebro-spinal fluid and autonomic system follows.

In Part II the author takes up the normal physiology of the sensory path with special references to the association between thalamus and cortex.

Clinical phenomena from lesions, experimental or otherwise, in these pathways, visual, cochlear or olfactory, are considered and illustrated.

The same is done for the motor pathway and the whole is correlated with modern ideas of cerebral function and clinical concepts of "reflexes," "posture" and "muscle tone." Nor are the lessons of Pavlow on conditioned reflexes neglected. A few histological methods are included; here, however, we notice a slight error in that a mordanting of the tissues in Weigert's "glabiese" before staining in osmic acid is not mentioned in Robertson and Heller's myelin stain. An index follows and the literature is sufficient to indicate the source of the latest opinions presented.

This is a book of real value for revising studies involving the central nervous system.

PROGRESS IN NEUROLOGY AND PSYCHIATRY.

"NERVOUS AND MENTAL DISEASES," by Peter Bassoe, is one of the "Practical Medicine Series" published in Chicago by the Year Book Publishers.[2] The book consists of abstracts from the literature in nervous and mental diseases, published throughout the year 1928.

The abstracts are classified under different headings, for example, diseases of the brain, diseases of the spinal cord

[1] "An Introduction to the Study of the Nervous System," by E. E. Hewer, D.Sc. (London), and G. M. Sandes, M.B., B.S. (London), M.R.C.S., L.R.C.P.; 1929. London: William Heinemann (Medical Books) Limited. Crown 4to., pp. 116, with illustrations. Price: 21s. net.

[2] The Practical Medicine Series: "Nervous and Mental Diseases," Edited by Pete Bassoe, M.D.; Series 1928; Chicago: The Year Book Publishers. Crown 8vo., pp. 378, with illustrations. Price: $2·25 net.

et cetera are put under their respective headings. This gives a certain degree of consecutiveness to the reader. Of necessity, no attempt has been made to give any elementary details of the anatomy or physiology of the nervous system. The book is simply a series of epitomized editorial comments.

The articles are, for the most part, well chosen and clinical material is abundantly quoted in the form of rare or unusual cases that have been met with by the various authors of the articles.

Interest will be found for the general medical reader, as well as for the neurologist, in the useful and well tabulated information that is present.

Recent work on the physiology of the cerebro-spinal fluid and meninges is given as clearly and concisely as possible in an abbreviated form.

It is with some surprise that we find epilepsy and narcolepsy dealt with under the heading of "The Neuroses," without any reference to the more conventional psychogenic neuroses. Kinnear Wilson's article on epileptic variants is decribed at some length and a clear summary of his views is given.

Possibly the best part of the work is that dealing with the recent work in cerebral tumours and ventriculography. Rare conditions, such as angiomata of the brain and retina (von Hippel-Lindon's disease) are interestingly dealt with, together with autopsy findings.

Wimmer's more recent work in connexion with epidemic encephalitis, as well as some of the rarer chronic forms of this disease, is well described.

The section of the book dealing with mental diseases is not so comprehensive. No mention is made of work by British author's such as Sutie, Gillespie, Beaton and many others whose work has appeared in British neurological and mental journals. An abstract of an article by Strecker on the psychological conception of mental disease gives some insight into the modern trend of thought in psychiatry. An article on the study of puerperal psychosis from the psychoanalytical standpoint is abstracted at unnecessary length. Some recent work on the adrenalin blood pressure curves in *dementia præcox* and the emotional psychoses is of interest. Treatment of manic-depressive psychosis by the intraspinal injection of horse serum stimulates interest in this form of treatment. An abstract of an article on the classification of senile mental disorder is of clinical value.

The book is well indexed and the references to the articles are all fully given on the same page as the abstracts. As a reference to certain of the 1928 literature in neurology and psychiatry, the book is of value.

ARTHROPLASTY.

ONE of the most remarkable achievements of modern surgery is the restoration of function to a damaged joint by the operation of arthroplasty. This difficult subject is admirably traversed in their recent book[1] by W. R. and A. R. MacAusland. At the outset it is emphasized that while arthroplasty is a standardized form of treatment for ankylosed joints, its application is limited, its technique exact and considerable judgement is necessary in the selection of suitable patients. The volume is divided into four parts.

Part I is devoted to the ætiology, pathology and treatment generally of ankylosis. Particular stress is laid on the importance of foreseeing that a joint which is the site of a destructive lesion likely to lead to ankylosis, is ankylosed only in a position that will allow of a maximum of function to the limb. So many of the joints the authors have to deal with, have been allowed to become ankylosed in a position which results in poor function. This is especially important when it is realized that the hip, knee, wrist and shoulder, when ankylosed in correct positions, are of functional value; particularly the shoulder, where ankylosis in the functional position of mid-abduction and slight flexion should, in the opinion of the authors, rarely call for mobilization. The different recognized methods of treatment are described briefly and historically.

Part II is concerned with the description of arthroplasty, its nature, history, the different methods of its performance, its indications and contraindications and results. A strong point is made of the maintenance of stability in a mobilized joint, an unstable mobile joint being a greater disability than ankylosis; the authors' methods of operation are designed with this object in view. The test of success of an arthroplasty lies in affirmative answers to the questions: Is there sufficient motion in the joint to increase function? Is the motion painless? Is the joint stable? The particular joints suitable for arthroplasty are emphasized.

Part III involves consideration of the operations for the individual joints and the authors give a simple description of their technique, perhaps too simple. A brief and satisfactory *résumé* of the literature concerning each joint is included. The descriptions are generally clear except in regard to the hand and foot, of which the anatomical terminology is frequently loose and confusing. The thumb, for instance, is described as being on the inner side of the hand and the tibial side of the foot as the lateral side. Exception may be taken, too, to the employment of the word pathology in the sense of pathological condition or lesion. Apart from these no unfavourable criticism of the book is possible.

Part IV consists of a brief note on the prevention of ankylosis; it contains sound and commonly followed principles.

THE MUSEUM IN MEDICINE.

MEDICAL museums in Australia leave much to be desired. Museum work, once so prominent in medical education, has been overshadowed during recent years by other branches of medical science, but a recent publication by S. H. Daukes, entitled "The Medical Museum," will do much to stimulate interest in museums in general and medical museums in particular.[1] The author deals with modern developments, organization and technical methods based on a new system of visual teaching and is an amplification of a thesis read for the degree of Doctor of Medicine of the University of Cambridge. There are ten chapters and eight appendices.

In the first chapter the author discusses the functions of a medical museum and draws attention to Sir Arthur Keith's statement that a medical museum is an instrument for the preservation and propagation of knowledge relating to the processes which take place in living matter both in health and in disease; that such a museum becomes a consulting library in which specimens take the place of manuscripts and books. In later chapters Dr. Daukes discusses in detail the new system of visual teaching by specimens and exhibits; labelling, arrangement of specimens, classification, models, casts, photographs, photomicrographs *et cetera* are all given due consideration.

In the appendices the author describes buildings and equipment, methods of mounting specimens, arrangement of the various sections of the museum and means of displaying exhibits of all kinds to the best advantage.

An extensive bibliography is appended and there is a large number of excellent illustrations, showing what has been done in the Wellcome Museum of which Dr. Daukes is the director.

The book will be most helpful to museum workers and if the suggestions made by Dr. Daukes are adopted, medical museums will have a far wider appeal in the future than they have had in the immediate past.

[1] "The Mobilization of Ankylosed Joints by Arthroplasty," by W. Russell MacAusland, M.D., and Andrew R. MacAusland, M.D.; 1929. Philadelphia: Lea and Febiger. Royal 8vo., pp. 252, with illustrations. Price: $4·00 net.

[1] "The Medical Museum: Modern Developments, Organization and Technical Methods Based on a New System of Visual Teaching," by S. H. Daukes, O.B.E., M.D., D.P.H., D.T.M. & H., Director of the Wellcome Museum of Medical Science; 1929. London: The Wellcome Foundation, Limited. Crown 4to., pp. 183, with illustrations.

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A Retrospect.

Gynæcology.

It has become customary to distinguish gynæcology from surgery and to allot a special place to this restricted branch of surgical practice. Formerly the gynæcologist did not encroach on the abdomen, but limited his activity to the pelvis of the female. In more recent years the gynæcologist has approached the organs of generation by any available route and has included in his sphere the urinary organs of the female. At times the dividing line between gynæcology and obstetrics is a thin one and the gynæcologist seems to be inclined to trespass on his colleague's preserves, provided that a major operation is deemed necessary or desirable. For the purpose of this retrospect gynæcology will be regarded as the surgery of the organs of reproduction of the female, excluding those measures concerned with the delivery of the fœtus and pathological conditions complicating the parturient or the puerperal state.

The subject that has claimed the first consideration of gynæcologists during the past twelve months, is malignant disease of the uterus. The Radiological Subcommittee of the Health Organization of the League of Nations has issued an extremely valuable report on the treatment of uterine cancer by radium and X rays. Three clinics were selected for the purposes of this report, the Radiumhemmet in Stockholm, the gynæcological clinic in Munich and the Radium Institute in Paris. While the methods of applying radium in these three institutions have not been uniform, it is evident from the individual reports that in skilled hands the radium treatment of uterine cancer reinforced with X ray treatment is capable of yielding much better results than does surgical removal. H. M. Moran has reviewed the general principles of the treatment of uterine cancer and F. A. Maguire has given an account of the work conducted in the radium clinic of the Royal Prince Alfred Hospital. Polak has given his experience of fifteen years' work with radium, while Adler has reported on the results of one thousand vaginal operations for cancer of the cervix. G. Strachan has given the details of his technique of applying radium for carcinoma of the uterus. It will thus be noted that radium, surgical methods and to a less extent X rays have been applied on a very large scale in the treatment of uterine carcinoma and that gynæcologists are endeavouring to set up a formula for the correct treatment. It appears that the balance of opinion at the present time is in favour of radium treatment for carcinoma of the *cervix uteri*, but that there is still a want of unanimity in regard to technique.

R. Fowler has published an admirable account of the morbid anatomy of uterine prolapse. He has gathered together all the observed details of the morphology of prolapse, but the physical and dynamic aspects of the condition seem to have been neglected.

Endometriomata of the ovaries, uterus, recto-vaginal septum and other pelvic tissues have been closely studied. Cleland, Dawson and others presented a mass of details to the Australasian Medical Congress (British Medical Association), Sydney, 1929. King and Fiddes have published an excellent article on this subject in *The Journal of the College of Surgeons of Australasia*. Sampson has also contributed some useful information in this regard. Tansey and Utz have done some good work on chorion epithelioma.

Vogt has extended his obstetrical observations on the ocular disturbances in parturient women to purely gynæcological conditions. He describes ocular disturbances following the anæmia of uterine myomata and mentions as a rarity metastatic neoplasms of the eye when the primary growths are situated in the uterus or ovary. In connexion with myomata and other causes of uterine hæmorrhage Schneider and Keatinge have both irradiated the spleen. It is said that good results are obtained in this way. The employment of diathermy in the treatment of inflammatory and malignant con-

ditions of the pelvic organs, including gonorrhœa, has been well explored by F. A. Maguire. Some gynæcologists do not admit that diathermy for the purpose of destroying tissue offers any therapeutic advantages over other methods of treatment and a few have warned against the use of this method.

Mention should be made of Coghlan's contribution on isthmiospasm of the Fallopian tubes and of King's paper on the pathology of carcinoma of the ovary, both of which have appeared in *The Journal of the College of Surgeons of Australasia.*

Therapeutics.

During the course of the year 1929 it has been found that the oil of the tea tree of Queensland, *Melaleuca alternifolia,* has a Rideal-Walker disinfectant coefficient of 11. The oil has been found to be non-poisonous and practically non-irritant. These qualities and properties have suggested that the oil may prove of importance in therapeutics. Some preliminary observations have been carried out and it transpires that in a spirituous soapy solution it dissolves pus and cleans up suppurating and dirty wounds in a remarkably rapid time. In ordinary surgical practice it should prove valuable; there are indications that it is of use in certain gynæcological conditions; it is being tried for some forms of dermatitis; in oral suppuration or sepsis it seems to yield good results. It is too early to determine its actual therapeutic place and powers, but sufficient information is available to justify extensive trials in divers conditions.

In connexion with septic infections and septicæmia various substances have been recommended very warmly. Colloidal preparations of silver and other metals, mercurochrome and arsenical preparations have their champions. Mercurochrome is said to be valuable in puerperal sepsis. Mellanby has suggested that vitamin *B* containing substances can be used with advantage in septicæmia. Up to the present other investigators have not confirmed his findings, but the validity of his contentions must be regarded as still undecided.

For scarlet fever antistreptococcal serum is said to yield excellent results in many patients. Bargen claims to have isolated from stools a diplostreptococcus which causes ulcerative colitis. He has prepared a vaccine from this organism and states that it has a definite action. Some of the arsenical compounds are held to be useful adjuvants in the treatment of ulcerative colitis.

For pernicious anæmia "Insulin" in addition to liver has been exhibited by von Varga; other clinicians have also used the former preparation. It appears that its use is empirical and is not based on any known physiological action.

Although the stream of new drugs and reputed remedies has continued as usual throughout the year, none has earned a right to recognition. Of the older medicaments quinidine has been subjected to pharmacological experiment. Bramwell and Ellis have found its action reliable in auricular fibrillation, particularly in association with thyreotoxicosis. They hold that the patient should be placed under the influence of digitalis before quinidine is given.

Theophylline has been strongly advocated as a diuretic in heart failure. Theophylline is one of the xanthine derivatives. Musser has obtained good results from theophylline-ethylenediamine in painful cardiac conditions, such as *angina pectoris* or coronary thrombosis.

The use of sulphocyanate of soda has been advocated for the reduction of raised blood pressure. The therapeutic dose of one gramme is tolerated without untoward effect, notwithstanding the fact that two grammes are given as the minimum lethal dose for man. It is rapidly excreted and its toxicological action on the blood and tissues is readily repaired. Ephedrine is also administered for the purpose of reducing blood pressure. A warning, however, has been issued against this drug in heart failure. For hay fever and asthma it is being preferred to adrenalin by some clinicians, although many others are by no means satisfied with its action.

In the treatment of chronic arthritis "Atophan" is still being used with caution, but seems to be less popular than formerly. "Salihexin" is said to yield good results. It is a synthetic compound prepared by the interaction between hexamine and acetylamino-salicylic acid.

Among a host of other therapeutic remedies mention may be made of sodium carbonate for biliary disinfection, of alkalis for gastric and duodenal ulcer and of iodine as a prophylactic in certain forms of goître.

Ophthalmology.

A review of the work published in the last twelve months in opthalmological journals would prove to be disappointing. Apart from the absence of important discovery, little that can be regarded as new, is included. There is, however, an indication that ophthalmologists are seeking collaboration with neurologists, with psychologists and with physicists in the study of some of the more obscure problems affecting vision. During the course of the year the Committee on the Physiology of Vision of the Medical Research Council has issued a number of reports. There is one on errors made in reading and the relation of meaning to perception in reading. This report is a sequel to a report on legibility of type and is a valuable contribution to our knowledge of the processes involved when an ordinary individual reads silently or aloud. The psychological responses to visual impressions are extremely complex, but are worthy of careful consideration from the point of view of pure physics.

The subject of the adaptation of the eye and its relation to the critical frequency of flicker has been dealt with by Lythgoe and Tansley in another report. They found that the critical frequency referable to the cones falls during dark adaptation and with decreasing levels of light adaptation; that the critical frequency referable to the rods rises both during dark adaptation and with decreasing levels of light adaptation; that the peripheral cones are functionally not identical with the foveal cones; that the brightness of the surrounding objects is the most important factor in determining whether the rods or the cones are concerned. Dorothy Adams has published a very valuable review of the literature of dark adaptation in the form of another report. M. Salaman has attacked the problem of peripheral vision and has produced a highly interesting report. He has divided his experimental work into two parts, the first reserved to perception of movement and the second reserved to perception of form. Langlands has approached the immensely difficult problem of binocular vision and has undoubtedly contributed largely toward its solution. The reduction of the data concerned in binocular vision to mathematical terms and the analysis of the phenomena from the point of view of physics has hitherto been disappointing.

Corbett has described and advocated the method of Dupuy-Dutemps and Bourguet of performing dacryorhinostomy, a purely external operation within the capacity of the ophthalmic surgeon. He holds that extirpation of the sac is obsolete, an opinion by no means accepted by the majority of ophthalmologists.

Numerous articles have appeared dealing with trachoma, all bearing more or less on the work of Noguchi. It must be admitted that the ætiology of this affection has not yet been elucidated.

In the treatment of chronic glaucoma there is a tendency to seek for non-surgical means of cure. Abadie gives his patients a mixture of ergotine and calcium chloride, together with adrenalin by mouth. He holds that glaucoma is the result of stimulation of the vasodilators of the ocular vessels and therefore an affection of the sympathetic nervous system and not of the mechanism of the eye. He claims good results from his treatment. Since adrenalin is dissociated in the acid contents of the stomach, ephedrine has been suggested as a substitute. There is also a revival of the use of "Glaucosan" and other adrenalin derivatives. Pischel and Gifford and Wright have dealt with these preparations. The value of the "Glaucosan" in controlling tension is generally acknowledged. Some observers, however, have issued warnings of dangerous attacks of acute rise in tension following their use.

There have been several attempts within recent times to adjust contact glasses for conical cornea. These attempts have been attended with some success. O'Rourke has devised a simple apparatus for the placing of the shell in accurate position. J. R. Anderson has reported a successful case at the third session of the Australasian Medical Congress (British Medical Association) in Sydney.

As a fine point in diagnosis Foster Moore has drawn attention to the association of nævus of the

face and congenital anomalies of one eye with hæmangioma of the meninges.

Radiology.

Some highly interesting work has been conducted in Sydney on the biophysics of X radiation by W. H. Love. In the course of his studies on the effect of homogeneous X radiation on living tissue, he has found it advisable to measure in heat units the amount of energy falling on the tissue per second. This amount in effective radiation is astoundingly small. A formula has been set up for the calculation of the energy absorbed by living tissue. Love has further shown that the selective frequencies studied by him can be identified with the absorption discontinuity of the elements uranium and ruthenium, as well as of lead and bismuth. He has also put forward a working hypothesis to explain the phenomenon of inhibition. In a further investigation he has produced evidence that for homogeneous radiations of wave lengths corresponding to those of the $L\ \beta$ group of tungsten, the relation between density of line and intensity of radiation is linear when the time of exposure is constant and the density is small. He has also ascertained by the measurement of the wave length of the absorption line of homogeneous radiation of the chorio-allantoic membrane that the results obtained appear to indicate that the emission lines are those of lead and uranium. Both chemical analysis and spectral analysis of the ash of the egg reveal that these elements are present in small quantities. These biochemical observations will probably prove to be of the utmost importance in the future development of radiology.

No special advances of significance have been made in regard to the technical construction of X ray apparatus and machines. A valve rectifying machine has been introduced by which alternating currents through transformers can be rendered suitable for passage through the tube without a rotary transformer. Very high currents are obtainable by this method, provided that the supply is alternating, but if the machines are supplied by direct current, large rotary transformers are necessary. It thus appears that the advantage of this innovation is small.

In 1928 Bucky published the results of his experiments leading to the introduction of a special form of apparatus yielding heterogeneous rays of more than 1·6 Ångström units. These rays are spoken of as *Grenzstrahlen*. In the course of the year considerable therapeutic application of these rays has been made. Herman Lawrence and others recommend *Grenzstrahlen* particularly for rodent ulcers.

Flecker has demonstrated that the coats of the ocular bulb can be seen quite distinctly in skiagrams of the skull. Shorney has advocated the use of bone-free skiagrams to assist in the diagnosis of certain small and transparent foreign bodies in the anterior portion of the eye.

In radiography for diagnostic purposes, when it is desired to demonstrate soft tissues, such as the kidney, liver or spleen, currents of high milliampèrage at comparatively low voltage are now used. The exposure for the kidneys and gall bladder is usually between one and one and a half seconds.

For bone, joint and deep work it has been found that small currents at a low milliampèrage with long exposure and complete immobilization of the part, yield the best results. This implies a return to the practice of the past when small currents only were available.

With improved technique the radiology of diverticulosis has thrown some light on this affection. In gall bladder radiography the skiagrams are becoming clearer and more accurate. Soluble salts of the opaque medium, given in one dose, have replaced the older method of giving numerous capsules.

Considerable progress has been made in all parts of the world in regard to the radiological examination of the lungs for tuberculosis and bronchiectasis. Many shadows in the lungs, previously not understood, can now be correctly interpreted. The use of iodized oil is necessary only under special conditions for the purpose of demonstrating the presence of bronchiectasis.

The therapeutic use of X rays, of deep X rays and of radium for the treatment of malignant tumours is referred to elsewhere in this series of articles. A vast amount of information is being

collected in every country concerning the effect of radiation treatment of malignant growths. Unfortunately the conditions under which the treatment is being carried out, vary so greatly that the results of this work cannot be collated and presented for critical analysis. Until some standardized scheme has been adopted, it will remain impossible to compare results obtained at different institutions.

Urology.

Although the term urology is usually employed to signify the surgical treatment of diseases of the urinary organs, it is advisable to extend the application of this term in order that it may embrace the physiology and pathology of the organs of secretion and excretion of the urine, the clinical aspects of disorders of these organs and the relation of these diseases to disturbances of other systems, organs and tissues of the body. Bolliger and other workers at the Royal Prince Alfred Hospital in Sydney have contributed some sound information on the nature and course of acute and chronic nephritis. Bolliger has in particular contributed to our knowledge concerning the excretion of phosphates by animals affected with chronic interstitial nephritis, concerning the sodium thiosulphate test in pregnancy and concerning the possibility of producing fibrotic and destructive changes in the kidney by exposure to X rays.

Turning to diagnosis of renal lesions, some interesting work has been carried out by T. Goldenberg in connexion with pneumo-pyelography. He claims that the method has become a safe one of great practical value and that it has definite indications for its application, more particularly in the presence of calculi. J. Bredna and J. Simon have studied the diagnosis of small tumours of the renal pelvis and have arrived at the conclusion that pneumo-pyelography provides an exact method for the detection of these growths. Intravenous pyelography has been introduced for the purpose of revealing a clear picture of the kidney. The opaque medium is injected into the general circulation and when the medium reaches the kidney, a skiagram of the kidney is made. A. Roseno and T. Hryntschak claim that they have been able to determine the time when the medium reaches the organ and that very distinct shadows of the renal pelvis and ureter can be obtained in this way. D. M. Morison has conducted some experiments which appear to prove that what is known as the pyelo-venous backflow is the result of trauma and that with low degrees of pressure within the renal pelvis the first channel of absorption is by the lymphatics, while with higher pressure it takes place by way of the tubules.

E. O. May has devised a method for the prevention of recurrence of renal calculi. A. Goldstein has confirmed the opinion long held in France that better remote results are obtained after incision of the renal pelvis and ureter if no sutures are employed.

S. Harry Harris has devised a new and simple operation for the repair of urethro-vesico-vaginal fistula. The destruction of the urethra has been regarded as an almost incurable condition; by the new method it can be restored both from an anatomical and from a physiological point of view.

The advocacy of the transvesical operation for high vesico-vaginal fistula by F. Farman and R. C. Thompson and by R. J. Silverton should be mentioned in this place. A. Fullerton holds that sepsis constitutes the most important problem not completely solved in the management of patients undergoing prostatectomy and advises the employment of a perineal drainage tube after suprapubic enucleation has been performed. W. I. de C. Wheeler has described an original method of performing immediate or secondary suture of the urethra after complete traumatic rupture. M. L. Boyd has called attention to the real importance of stricture of the external urethral meatus in the female. He is of opinion that mere dilatation is insufficient; meatotomy should be performed. E. C. Ryall has come to the conclusion that pseudo-membranous trigonitis accounts for many obscure forms of frequent and painful micturition in women. E. W. Hirsch issues a salutary warning to practitioners who use the urethroscope, that cauterization of the urethral glands is useless, since the duct and not the acini of the glands can be destroyed. A. L. Dean deprecates the operative removal of glandular metastases of malignant tumours of the testis. He combines simple orchidectomy with high voltage X ray and radium therapy.

Abstracts from Current Medical Literature.

GYNÆCOLOGY.

Irregular Uterine Hæmorrhage.

WILFRED SHAW (*Journal of Obstetrics and Gynæcology of the British Empire*, Spring Number, 1929) has published a paper dealing with the question of irregular uterine hæmorrhage. He has arrived at the following conclusions. Chronic endometritis is relatively a rare disease and it accounts for only a small percentage of the irregular uterine hæmorrhages in which no physical sign is present. Such hæmorrhages cannot be accounted for by chronic inflammatory conditions of the myometrium. The involution of the puerperal uterus has been reinvestigated and it has been shown that the views of Goodall cannot be supported. The vessels of the uterus are reduced in size through atrophic changes in their walls which in the veins and sinuses are peculiar in that a hyaline degeneration first occurs. The reduction in the calibre of the lumen is mainly determined by a proliferation of the subendothelial tissues. The elastic tissue content of the uterus is invariably increased after each puerperium, so that the uterus of a *multipara* who has borne many children, always contains a large amount of elastic tissue. This deposit should be regarded as physiological. It is not determined by the condition of subinvolution. There is no reason to believe that the elastic tissue content of the uterus in any way controls the incidence of irregular catamenia. There is no evidence to support the view that irregular uterine hæmorrhage is determined by subinvolution. Of the patients with irregular uterine hæmorrhage admitted to hospital 26·5% were shown to belong to the group described by Schroder, under the term *metropathia hæmorrhagica*. An account has been given of the morbid anatomy and clinical features of this disease. The prominent form of menstrual irregularity is that in which the cycle is reduced and the periods are excessive. It has been shown that the excessive bleeding can be attributed to hyperæmia of the endometrium. The alteration in the menstrual cycle is due to ovarian disturbances leading to a reduction in the ovarian cycle. It has been found possible to classify other hæmorrhages into well defined groups in which ovarian disturbances can again be demonstrated, but in 17·5% no explanation of ætiology has been offered. An account has been given of the morbid anatomy and clinical features of the endometritis which has been investigated. It has been proposed that the term metropathia be used to describe those irregular uterine hæmorrhages in which there are no physical signs to explain the abnormal hæmorrhage, and that the terms endometritis and chronic metritis be strictly limited to conditions in which a true infection of the uterus can be demonstrated.

The Diagnosis of Early Uterine Cancer.

EMIL NOVAK (*American Journal of Obstetrics and Gynecology*, October, 1929) reports from the Gynæcological Department of the Johns Hopkins Medical School his observations regarding the early diagnosis of uterine cancer and its differentiation from inflammatory conditions. He holds that just as appendicitis is diagnosed long before peritonitis occurs, cancer will be diagnosed in the future at a similar stage. He emphasizes, however, the necessity for differentiating between malignant and inflammatory conditions. He urges that all suspicious tissue should be subjected to biopsy by someone well trained in pathology. He reviews the microscopical appearances of inflammatory and early malignant conditions in the cervix and urges that gynæcologists should become expert in examining their own sections. He emphasizes the importance of combining the clinical with the pathological observations. Tissue in biopsies should be removed with a sharp knife and not with a cautery, as the latter tends to cause shrivelling of the pieces. The specimen should be made from the area which is most under suspicion, and not from the adjoining areas and the tissues should be cut at the proper angle in making the section with a view to showing the mucosa. While cancer is rarely found when there is no clinical suspicion whatever present, it is often revealed when only clinical manifestations are suspected; in many such lesions it will be found to be benign and so many uteri can be saved from removal.

An Unusual Vaginal Infection.

E. WORDLEY (*The Lancet*, November 16, 1929) reports a vaginal infection in a young married woman, aged twenty years, which had all the appearance of being but which was not gonorrhœal in nature. Eight days after marriage a profuse vaginal discharge appeared together with much irritation around the vulva. Smears were taken for examination and it was determined that divorce proceedings would be instituted if a diagnosis of gonorrhœa were made. Examination revealed numerous pus cells and Gram-negative diplococci, both extracellular and intracellular in type, exactly resembling the gonococcus. Cultures on blood agar yielded no colonies resembling the gonococcus, but a pure growth of fairly large whitish, rather opaque colonies. When these were stained, they were found to consist of Gram-negative diplococci of the exact size and shape of the gonococcus. On first culture they grew luxuriantly on plain agar at room temperature and at 37° C.. Maltose and dextrose were acidified, but not lactose. The author points out that apart from the sugar reaction, the fact that abundant growth was obtained on plain agar at room temperature, completely excludes the possibility of the organism being the gonococcus. No infection was found in the husband. It was concluded that the patient became infected with an organism resembling the *Micrococcus catarrhalis* or with an aberrant staphylococcus as the result of the trauma occurring during the early days of the honeymoon. The author lays stress on the necessity for a complete and thorough examination of both husband and wife when there is the slightest doubt about a venereal infection.

Carcinoma of the Fallopian Tube.

L. R. WHARTON AND F. H. KROCK (*Archives of Surgery*, November, 1929) point out that primary carcinoma of the Fallopian tube is one of the rarest of gynæcological diseases. They have collected records of fourteen cases. The growth is highly malignant. It rapidly reaches the inoperable stage if the tubal ostium is opened and peritoneal implantations occur. If dissemination is prevented by closure of the fimbriated extremity, the growth may remain circumscribed for some considerable time. The authors point out that the unsatisfactory results obtained in the past by surgery are probably due to two facts, that surgical intervention has often been tardy and that the operative procedures have been extremely conservative. The earliest and most constant symptoms are sharp, lancinating pelvic pain, associated with vaginal discharge which may at times be tinged with blood. Diagnosis is extremely difficult, but the malignant nature of the disease can usually be determined on the operating table by the routine examination of tissues immediately after their removal.

OBSTETRICS.

Blood Pressure in Pregnancy.

EDWARD L. CORNELL (*American Journal of Obstetrics and Gynecology*, July, 1929) has investigated the blood pressure readings in one thousand consecutive pregnant women. The patients have been divided into three groups: those with a systolic pressure below 129 millimetres of mercury, those with a systolic pressure between 130 and 139 millimetres and those with a pressure above 140 millimetres. In the first group the blood pressure throughout pregnancy is lower than in normal non-pregnant women. There is practically no change in the average readings from one month to another, the minimum being 108·7 and the maximum 113·1. In the second group appear the patients with potentially toxic conditions. These patients demand more attention than is usually given them, since a certain percentage was proved to manifest signs of intoxication. In the third group are

seen the patients with toxic conditions. In the series of studies there was no patient with eclampsia. There is only an average difference of six points in the diastolic readings taken in the fourth and fifth phases. The latter reading is more accurate and should therefore replace the fourth phase reading in recording the diastolic pressure. The average readings in all patients have been somewhat lower than is usually recorded. This is not an accurate gauge, since a rather high percentage of patients has a blood pressure of more than 140 millimetres.

Radium or Röntgen Irradiation and the Fœtus.

DOUGLAS P. MURPHY (*American Journal of Obstetrics and Gynecology*, August, 1927) has reviewed 625 pregnancies in women subjected to pelvic irradiation treatment. He has tried to ascertain what influence the treatment has had upon the health and development of children. He concludes that irradiation before conception may be followed by the birth of unhealthy or defective children. It cannot definitely be stated that such maternal treatment has a detrimental influence on the health of subsequent children. Irradiation of the pregnant women is extremely likely to be followed by the birth of seriously defective offspring. The frequency of these defects and their conformity to a type in which microcephaly is the most common, strongly suggest that they are the result of the irradiation received by the embryos *in utero*. Diagnostic curettage should always precede pelvic radiotherapy in order to avoid possible irradiation of the growing embryo. The pregnant uterus should never be subjected to radiotherapeutic exposures.

Uterus Bifloris.

K. JAROSCHKA (*Monatsschrift für Geburtshülfe und Gynäkologie*, March, 1929) describes a rare congenital malformation of the cervix which caused severe *intrapartum* hæmorrhage. This was due to a thick septum in the cervix near the external *os*. *Placenta prævia* was considered possible at first and the real cause was not discovered until vaginal Cæsarean section was performed owing to the condition of the patient. No other malformations were noted. He also describes another instance in which the septum was situated near the internal *os*. While the condition is common in some animals, it is very rare in man. The septum is supposed to be due to hyperdevelopment of one of the *plicæ palmatæ* of the cervical canal.

Congenital Dilatation of the Fœtal Bladder.

E. GOLDBERGER (*Monatsschrift für Geburtshülfe und Gynäkologie*, March, 1929) describes a congenital dilatation of the fœtal bladder which caused considerable difficulty during delivery. The fœtus had been delivered as far as the neck when further progress was impossible until evisceration and puncture of a cystic swelling in the pelvis had been done. One and a half litres of fluid were evacuated from the mass which proved to be due to a congenital dilatation of the bladder. It was associated with hydroureter and hydronephrosis. The urethra and bladder did not communicate with each other for a distance of three centimetres. The interest of the case lies, first, as an example of dystocia which could not be diagnosed before delivery, and, secondly, as a proof that the old theories are incorrect regarding the fœtal urine as the main source of the *liquor amnii*.

Serum Treatment of Puerperal Sepsis.

J. WOZAK (*Monatsschrift für Geburtshülfe und Gynäkologie*, February, 1929) details his results in the treatment of puerperal sepsis following the use of a filtrate obtained from a polyvalent antistreptococcal serum. The filtrate was used as a prophylactic measure for patients with fever during delivery, while a similar number of patients was used as controls. The effect of administering fifty cubic centimetres prophylactically was not pronounced, the fever continuing in the puerperium equally in treated and untreated patients. However, in the actual treatment of sepsis the author considers that the serum proved to be most valuable. The dosage employed was fifty cubic centimetres repeated every day for seven days. Case histories are given and the author considers that this serum of Warnekros and Louros will prove of considerable value in treatment.

Treatment of the Premature Infant.

A. PEIPER (*Deutsche Medizinische Wochenschrift*, February 22, 1929) reviews his results in the treatment of one hundred premature infants. It is important, if possible, in every case during the first week to give breast milk. Most infants over 2,000 grammes in weight do equally well on milk mixtures. When these are used, the object is to make a mixture low in proteins and high in sugar, while the fat is gradually raised. Vitamins are supplied by giving orange or lemon juice to young infants and vegetables to those over five months. Six feeds daily are given at first and reduced to five at one month. Premature infants are especially liable to die during the first day of life from apnœic attacks. The author has found the use of one cubic centimetre of "Lobelin" of great value in such circumstances. Provided the first week is survived, the infant is still liable to attack by rickets, tetany, anæmia and infections of various kinds. Antirhachitic measures such as exposure to sunlight or the quartz lamp should be undertaken when the child is a fortnight old, in addition to a sufficient diet. The author has never had a premature infant with tetany probably because rickets has been prevented. Anæmia occurs constantly with premature children, especially with those suffering from digestive disturbances or general infections. The natural immunity of the premature child is very slight and infections, particularly of the air passages and pyuria, are common.

Air Embolism and Criminal Abortion.

G. STRASSMANN (*Monatsschrift für Geburtshülfe und Gynäkologie*, March, 1929) has had five deaths from air embolism in a series of sixty fatal cases of abortion. He emphasizes the difficulty of establishing the cause of death in many instances owing to the delay in conducting a *post mortem* examination. By this delay putrefactive gases form in the heart and venous system and prevent an accurate diagnosis. Recent work promises to establish an accurate method of differentiating between these. He recommends that in all suspicious cases the sternum should be divided only to the level of the second rib and the pericardium filled with water before the heart is investigated. He points out that all air embolisms are not acute, but that the patient may walk home after a soapy solution has been injected into the uterus and the entrance of air into the vascular system be delayed for some hours. The autopsy findings are similar in both sudden and delayed deaths. In addition there are some cases in which air emboli pass through a patent *foramen ovale* and gain access to the general circulation, causing death from cerebral embolism or from secondary pneumonia. Case histories are given illustrating the various types described.

Reid Hunt Reaction During Pregnancy.

R. BRÜHL (*Klinische Wochenschrift*, February 5, 1929) has been experimenting with the Reid Hunt acetonitril reaction in relation to the thyreoid gland and pregnancy. In animals fed with substances containing thyreoid or iodine there is an increased resistance to injections of acetonitril, preventing the latter exercising its lethal effect due to the formation of hydrocyanic acid. Clinically it would appear that during pregnancy there is increased activity of the thyreoid, as judged by the increase in size, raised basal metabolic rate and increased iodine content of the blood. An attempt was made to correlate these presumptive clinical signs with the Reid Hunt test. Blood from twenty-nine patients during pregnancy and the puerperium was injected into mice, 0·5 cubic centimetre for three days followed by 0·75 milligramme of acetonitril per gramme weight of the mouse. The results were disappointing, as practically every mouse died, showing that the maternal blood did not contain substances which would raise the resistance of the mouse to the poison injected. Portions of the thyreoid gland from fresh still-born infants were implanted in the subcutaneous tissues of mice and in three instances there appeared to be slight evidence of increased resistance to the drug.

British Medical Association News.

MEDICO-POLITICAL.

IN the record of the meeting of the Federal Committee of the British Medical Association in Australia held on September 2, 1929 (see THE MEDICAL JOURNAL OF AUSTRALIA, October 19, 1929, page 588) a brief account of the discussion on the draft Memorandum and Articles of Association and By-Laws of the Federal Council of the British Medical Association in Australia was published. It was intimated that the full text would be published in a subsequent issue. The full text is as follows:

Memorandum of Association of the Federal Council of the British Medical Association in Australia.

1. The name of the Company is the Federal Council of the British Medical Association in Australia.
2. The Registered Office of the Company will be situate in

3. The objects for which the Company is established are:
   (*a*) To act as a corporate body in Australia in conformity with the regulations of the British Medical Association (incorporated in England) for the time being in force and applicable to this Company for the purpose of carrying out the objects of the British Medical Association on behalf of the Branches of the Association collectively in Australia and with a view thereto to enter into the Agreement referred to in Clause 2 of the Articles of Association of this Company and to carry the same into effect.
   (*b*) On behalf of or in conjunction with the Branches of the British Medical Association collectively in Australia to carry out within Australia any of the objects of such Branches and to use any means authorized by the Memorandum, Articles of Association, By-laws or Regulations of such Branches for the attainment of any such object.
   (*c*) (i) To promote in Australia the medical and allied sciences;
   (ii) To maintain the honour of the medical profession in Australia; and
   (iii) To promote and maintain the interests of the medical profession in Australia.
   (*d*) To hold or arrange for the holding of periodical meetings of the members of the Federal Council and of members of the Branches of the British Medical Association in Australia and of the medical profession generally.
   (*e*) To circulate such information as may be thought desirable by means of a periodical journal which may be the journal of the Federal Council and by the occasional publication of transactions or other papers.
   (*f*) To grant sums of money out of the funds of the Federal Council for the promotion in Australia of the medical and allied sciences in such a manner as may from time to time be determined on.
   (*g*) Subject to any such restriction as may for the time being be imposed by law to purchase take on lease exchange hire or otherwise acquire any real and personal property and any rights or privileges necessary or convenient for the purposes of the Federal Council, and to sell improve manage develop lease mortgage dispose of turn to account or otherwise deal with all or any part of the property of the Federal Council.
   (*h*) To borrow any moneys required for the purposes of the Federal Council upon such terms and upon such securities as may be determined.
   (*i*) To do all such other lawful things as may be incidental or conducive to the promotion or carrying out of the foregoing objects or any of them, or as are in the opinion of the Federal Council so incidental or conducive. Provided that the Federal Council shall not support with its funds any object or endeavour to impose on or procure to be observed by its members or others any regulation restriction or condition which if an object of the Federal Council would make it a trade union.

4. The income and property of the Federal Council from whatever source derived shall be applied solely towards the promotion of the objects of the Federal Council as set forth in this Memorandum of Association and no portion thereof shall be paid or transferred directly or indirectly by way of dividend or bonus, or otherwise by way of profit to the persons who at any time are or have been members of the Federal Council or to any person claiming through any of them provided that nothing herein shall prevent the payment in good faith of remuneration to any officers or servants of the Federal Council or to any member of the Federal Council or other person in return for any services actually rendered to the Federal Council or shall prevent the payment of interest on money borrowed from or lawfully due to any member of the Federal Council.

5. The fourth paragraph of this Memorandum is a condition on which the licence is granted by His Excellency the Governor with the advice of the Executive Council to the Federal Council in pursuance of Section 54 of the *Companies Act*, 1899.

6. The liability of members is limited.

7. Every member of the Federal Council undertakes to contribute to the assets of the Federal Council in the event of the same being wound up during the time that he is a member or within one year afterwards for payment of the debts and liabilities of the Federal Council contracted before the time at which he ceases to be a member and the costs charges and expenses of winding up the same and for the adjustment of the rights of the contributories amongst themselves such amount as may be required not exceeding the sum of one guinea.

Articles of Association of the Federal Council of the British Medical Association in Australia.

Interpretation.

1. In these Articles of Association (where not repugnant to the context) the words and expressions following have the meanings hereinafter assigned to them respectively:

"The Federal Council" means the above-named Company.

"The Executive Committee" means the Executive Committee appointed pursuant to these Regulations.

"The British Medical Association" means the British Medical Association (incorporated in England).

"Member" means member of the Federal Council or any person appointed as a substitute for such member under the provisions of these Articles.

"Branch" means a Branch of the British Medical Association in Australia.

"Branch Council" or "Council of a Branch" means the Council of a Branch of the British Medical Association in Australia and when used in relation to a corporate Branch means the governing body of that Branch by whatever name the same may be called.

"The Regulations" means the Regulations contained in these Articles of Association with such modifications thereof or additions thereto as may from time to time be in force.

"The By-laws" means the By-laws of the Federal Council for the time being in force.

'The President," "Vice-President," "Treasurer," "Secretary," means those respective officers for the time being of the Federal Council and includes any person appointed to perform the duties of those respective offices temporarily.

"In writing" or "written" means written or printed or partly written and partly printed and includes any mode of reproducing words in a visible form.

Words importing the singular number only include the plural and words importing the plural number only include the singular.

Words importing the masculine gender include the feminine gender.

"Special resolution" means a special resolution of the Federal Council passed in accordance with the *Companies Act*, 1899.

"The office" means the registered office for the time being of the Federal Council.

"Seal" means the common seal of the Federal Council.

Agreement with the British Medical Association.

2. The Federal Council is established for the purposes expressed in the Memorandum of Association. The common seal of the Federal Council is forthwith to be affixed to an agreement with the British Medical Association to be in the terms of a draft agreement signed for the purpose of identification by and expressed to be made between the Federal Council of the one part and the British Medical Association of the other part which is intended to define the conditions upon which the Federal Council is to be entitled to use the words "British Medical Association" as part of the name of the Federal Council. The said agreement shall be forthwith transmitted to the British Medical Association and the same shall be strictly observed by the parties thereto.

3. The Federal Council shall not make any alteration in its Memorandum or Articles of Association unless and until the same shall have been submitted to and approved by the British Medical Association.

4. The Federal Council shall not be deemed to be an agent for and shall have no power to impose any responsibility or liability on or to pledge the credit of the British Medical Association in respect of any expenses acts matters or things incurred or done by the Federal Council.

Membership.

5. For the purpose of registration the Federal Council shall consist of twelve members but the Federal Council may register an increase in the number of members at any time.

6. The Federal Council shall be composed of such members of the Branches of the British Medical Association in Australia as shall have subscribed the Memorandum of Association of the Federal Council or as shall be admitted to membership in accordance with the provisions hereinafter contained relating to admission.

7. No person shall be admitted to membership other than a person subscribing the Memorandum of Association unless and until he shall have been elected by the Council of a Branch as a member representing such Branch and shall have lodged with the Secretary a certificate certifying to such election signed by the President of the Branch and shall have signed an acceptance of membership in the terms following, that is to say:

> "To the Secretary of the Federal Council of the British Medical Association in Australia.
>
> I of having been elected by the Council of the Branch of the British Medical Association to represent that Branch in the Federal Council of the British Medical Association in Australia request you to enter my name in the Register of Members of the Federal Council subject to its Memorandum and Articles of Association.
>
> Dated this day of 19 ."

8. The Council of each Branch shall be entitled to elect annually as members of the Federal Council two persons. A member of a Branch who has subscribed the Memorandum of Association shall for the purpose of this Regulation be deemed to have been elected by the Branch of which he is a member on the day on which the Federal Council is incorporated.

9. Save as next hereinafter provided and subject to the provisions of Regulation 12 hereof, the term of membership of the Federal Council except in the case of first members shall be for one year from the first day of January in the year succeeding the date of election. Provided that in the case of first members the term of membership shall expire on the thirty-first day of December 1930. Provided that every person who shall for the time being be a member of the Federal Council shall continue to be a member until another person shall have been elected as a member in his place by the Council of the Branch which he shall have represented or in such other manner as is provided for the election of members by the Regulations or the By-laws and have been duly admitted to membership.

10. The election of members other than first members by the Councils of the respective Branches shall take place not later than the thirty-first day of October in each year and such Councils shall forward to the Secretary of the Federal Council a notification of the result of such election so that the same shall be received by the Secretary not later than the thirtieth day of November in each year. Provided that any failure to elect or notify the election of a member prior to the dates respectively above-mentioned shall not invalidate any election made or notified after such respective dates if approved by the Federal Council, but in such case the subsequent election shall be as valid and shall take effect as if the member had been elected and such election notified prior to such respective dates.

11. The membership of a member of the Federal Council shall forthwith cease to exist in any of the following events:

(*a*) If he cease to be a member of the British Medical Association.
(*b*) If he die.
(*c*) If the Federal Council shall receive written notice from the Council of the Branch which has elected him that his membership has been terminated.

12. In the event of the membership of any member ceasing otherwise than by expiration of his term of membership the Council of the Branch which elected such member shall be entitled to elect another member in his place. Should such Branch Council in such event fail to elect another member within three calendar months of its receiving notice from the Federal Council of such vacancy in the membership or of such Branch Council having notified the Federal Council that a member representing it has ceased to be a member the Federal Council shall be entitled to nominate another member to fill such vacancy in the membership and such nomination and membership shall be in all respects valid notwithstanding any other provisions of these regulations relating to membership. In the case of any member elected under the provisions of this regulation he shall continue as a member for the remainder of the term only for which the member whose membership has ceased was elected.

Executive Committee.

13. The Federal Council may if it shall deem it desirable so to do appoint an executive committee of its members, which committee shall have the powers and perform the duties hereinafter provided. Upon the appointment of such Committee the provisions of Regulations Nos. 14 to 24 inclusive shall take effect.

14. The number of members of the Executive Committee inclusive of *ex-officio* members shall not be less than three nor more than six.

15. The first members of the Executive Committee shall hold office until the first annual meeting of the Federal Council after their appointment. At such meeting and at each succeeding annual meeting all the members of the Executive Committee for the time being holding office shall retire.

16. A retiring member of the Executive Committee shall retain office until the dissolution or adjournment of the meeting at which his successor is elected, notwithstanding that he may not have been re-elected as a member of the Federal Council.

17. The Federal Council at each general meeting at which members of the Executive Committee retire in manner aforesaid shall fill up the vacant offices by electing a like number of persons to be members of the Executive Committee.

18. If at any general meeting at which an election of members of the Executive Committee ought to take place the places of the retiring members of that committee are not filled up the retiring members or such of them as have not had their places filled up shall if willing continue in office until the next annual general meeting and so on from year to year until their places have been filled up unless it shall be determined at such meeting to reduce the number of the members of the Executive Committee.

19. The Federal Council in general meeting may from time to time increase or reduce the number of members of the Executive Committee and may also determine in what rotation such increased or reduced number is to go out of office.

20. The Federal Council in general meeting may remove any member of the Executive Committee before the expiration of his period of office and appoint another qualified person in his stead. The person so appointed shall hold office during such time only as the member of the Executive Committee in whose place he is so appointed would have held the same if he had not been removed.

21. The office of a member of the Executive Committee shall *ipso facto* be vacated:

(*a*) If by notice in writing he resigns.
(*b*) If otherwise than as a retiring Member to whom the provisions of Regulation 16 shall apply he ceases to be a Member of the Federal Council.

22. Any casual vacancy occurring among the members of the Executive Committee may be filled up by the members of the Executive Committee but any member of such committee so

chosen shall retain his office so long only as the vacating member would have retained the same if no vacancy had occurred.

23. The continuing members of the Executive Committee may act notwithstanding any vacancy in their body but so that if the number falls below the minimum above fixed the members of the Executive Committee shall not except for the purpose of filling vacancies act so long as the number is below the minimum.

24. If an Executive Committee shall be appointed pursuant to Regulation 13, the management of the business and the affairs of the Federal Council shall be vested in such Committee and it shall be the duty of the Executive Committee to administer the affairs of the Federal Council in accordance with the Memorandum and Articles of Association and the By-laws and the Executive Committee may exercise all such powers and do all such acts and things as the Federal Council is by its Memorandum or Articles of Association or otherwise authorized to exercise and do and are not hereby or by Statute directed or required to be exercised or done by the Federal Council in general meeting but subject nevertheless to the provisions of the *Companies Acts* and to these presents and to any By-laws not being inconsistent with these presents from time to time made by the Federal Council in general meeting. Provided that no such By-laws shall invalidate any prior act of the Federal Council which would have been valid if such By-laws had not been made.

Duties of the Federal Council.

25. Without in any way defining limiting or restricting the objects of the Federal Council or its powers or duties as conferred by its Memorandum of Association or these Regulations or by law, the Federal Council shall perform the following duties:

(*a*) It shall be the medium for communicating with the British Medical Association on behalf of the Branches thereof collectively in Australia in matters common to such Branches.

(*b*) It shall be the medium for communicating with the Government of the Commonwealth on behalf of the Branches collectively and when required so to do by any Branch it may in its discretion be a medium for communicating with the Government of the State in which such Branch is situated in any matter affecting the medical profession in that State.

(*c*) It may consider any matter affecting the medical profession in Australia and may act in connection therewith on behalf of the Branches.

(*d*) It may consider and act in any matter affecting the organization of the medical profession in Australia or any part thereof and may by arrangement with any Branch or if there be no Branch then of its own initiation undertake such organization.

Management.

26. If and whenever there shall be no Executive Committee the business and affairs of the Federal Council shall be managed by the Federal Council in General Meeting, or by such other Committee or Committees as it may appoint for any purpose.

27. (i) The Federal Council shall have power to appoint Committees in addition to the Executive Committee for such purposes and with such powers and duties as it may determine and may delegate to any such Committees such of its powers and duties as it may deem advisable so to do. It may also empower any such Committee to co-opt one or more members of the British Medical Association for the purpose of assisting it in carrying out such powers and duties.

(ii) A resolution in writing signed by all the members of a Committee shall be deemed equivalent to a resolution passed at a meeting of the Committee duly convened and held.

(iii) The President and Secretary shall be members *ex officio* of all committees, including the Executive Committee.

(iv) Any vacancy occurring in the membership of any committee may be filled by the President.

(v) Every Committee shall be appointed for a fixed time not exceeding eight months, but such time may be extended by resolution of the Federal Council or by the President by writing under his hand for a time not to continue beyond the close of the next meeting thereof.

28. (i) In respect of any matter under consideration by the Federal Council the President shall order a referendum of the members of the British Medical Association in Australia to be held at the request of any seven members present in person representing any four Branches.

(ii) Upon receipt of notice of such order the Secretary shall forthwith proceed to take such referendum in such manner as shall be prescribed by the By-laws or if there shall be no By-law governing the same then by resolution of the Federal Council.

Meetings.

29. The first meeting of the Federal Council shall be held at such time not being more than four months after its incorporation and at such place as the Secretary may determine.

30. Subsequent meetings shall be held at such times and places as the Federal Council shall determine; or, in the absence of such determination, as the President shall direct. Provided that it shall meet at least once in each year and shall meet for the first time in each year not later than the last day of March.

31. A meeting of the Federal Council shall be held whenever any three or more members representing not less than three Branches shall by requisition made in writing and signed by such members request the President to convene a meeting. Any such request shall express the object of the meeting proposed to be called and shall be convened only for the purposes specified in the request.

32. Upon the receipt of such request the President shall forthwith proceed to convene a meeting of the Federal Council and if the notices convening the same shall not be despatched within thirty days from the date of the receipt of the request those members who shall have signed the request may themselves convene a meeting.

33. Forty-two days' notice at the least specifying the place the day and the hour of any meeting of the Federal Council and in case of special business the general nature of such business shall be given to the members in manner hereinafter mentioned or in such manner as may be prescribed by the By-laws. When it is proposed to pass a special resolution the two requisite meetings may be convened by one and the same notice and it is to be no objection to such notice that it only convenes the second meeting contingently on the resolution being passed by the requisite majority at the first meeting or that it does not specify the day for the second meeting otherwise than by stating that the same will be held at an interval of fourteen clear days from the day on which the first meeting is concluded. Provided that in any matter of urgency at the request in writing of members representing any three Branches a meeting may be convened at such time and place and upon such shorter notice as the President shall direct.

34. Except in the case of meetings convened by the direction of the President in matters of urgency, notice of matters to be considered by the Federal Council at any meeting thereof shall be received by the Secretary not less than twenty-eight days before the date fixed for such meeting and may be received either from a member of the Federal Council or from the Council of a Branch, and shall be communicated to each member at the earliest opportunity.

35. A statement of the business to be transacted at each meeting either with the notice convening such meeting or as soon thereafter as may be practicable, shall be sent to each member. Except as next hereinafter provided no business shall be transacted at any meeting of the Federal Council of which notice has not been given in manner aforesaid. Provided always that with the consent of all members present any business may be taken and disposed of as to any matter of urgency which has arisen too late to permit of proper notice thereof being given.

Proceedings.

36. The proceedings of the Federal Council or of the Executive Committee or any other Committee appointed under these regulations shall not be invalidated by the non-receipt of or any accidental omission to give any notice required or by any vacancy among its members or by any defect in the admission or qualification of any of its members.

37. A resolution in writing signed by all the members of the Federal Council shall be as valid and effectual as if it had been passed at a meeting of the Federal Council duly convened and constituted. Such resolution shall be duly entered by the Secretary in the minute book.

38. Where any member shall be unable to attend any meeting of the Federal Council the Council of the Branch which such

member shall represent shall be entitled to nominate another member of such Branch or another member of the Federal Council to act as a substitute for the member who shall be so unable to attend and if it shall not nominate any such substitute the member who shall be unable to attend shall himself be entitled to appoint another member of the Federal Council to be his proxy for such meeting. The appointment of a substitute or of a proxy shall be in writing and if made by the Branch Council shall be signed by the Secretary of the Branch and if made by the member shall be signed by him. A substitute appointed as aforesaid shall also be entitled to appoint in writing another member of the Federal Council to be his proxy if he shall so desire. Any proxy may be limited to any part or session of a meeting of the Federal Council or to any specified question or questions and must be produced at the meeting at which the holder proposes to vote.

39. Questions arising at any meeting of the Federal Council or of the Executive Committee shall be decided by a majority of the votes of the members present in person or by proxy and in case of an equality of votes the chairman shall have a second or casting vote.

Officers.

40. The Federal Council shall at its first meeting in each year and subsequently from time to time as occasion so to do may arise appoint from among its members a President, a Vice-President, a Treasurer and a Secretary, who shall be the Officers of the Federal Council and shall have and enjoy such duties powers and privileges as shall be determined from time to time by the By-laws.

Secretary.

41. shall be the first Secretary and shall hold office until the first general meeting of the Federal Council to be held under these regulations. It shall be the duty of the Secretary to convene a meeting of the Federal Council so soon after the incorporation of the Federal Council as may be practicable for the transaction of all such business as may require to be transacted by these regulations or By-laws.

Notices.

42. Notice may be served by the Federal Council upon any member either personally or by sending it through the post in a prepaid letter or by a telegram addressed to such member at his registered address. Any notices sent by post shall be deemed to have been served at the expiry of ten days after the envelope or wrapper containing the same was posted and a notice sent by telegram shall be deemed to be served at the expiry of forty-eight hours after having been so sent.

43. Where a given number of days' notice or notice extending over any other period is required to be given the day of service shall unless it is otherwise provided be counted in such number of days.

44. Any notice required under the regulations or the By-laws to be given to a Branch or Branch Council may be given either to the President or the Secretary of such Branch or Branch Council.

Accounts.

45. The Federal Council shall cause true accounts to be kept of all sums of money received and expended and of the matters in respect of which such receipt and expenditure take place and of the property credits and liabilities of the Federal Council.

46. The Federal Council shall annually prepare a balance sheet and financial statement for the past year.

47. The Federal Council shall prepare a report in each year of its proceedings during that year and shall forward such report to the Council of the British Medical Association and to the Councils of the several Branches.

48. The expenses of the Federal Council until otherwise provided by the By-laws shall be met by annual contributions to be made by the respective Branches represented on the Federal Council the amount of such contributions being as from time to time determined by the By-laws. The By-laws may also fix the time and manner of payment of such contributions.

49. Members of the Federal Council and of the Executive Committee may be paid out of the funds of the Federal Council such sums of money by way of travelling or other out of pocket expenses incurred in connection with the performance of their duties as such Members as may from time to time be determined by By-law.

Seal.

50. The Federal Council shall provide for the safe custody of the seal and the seal shall not be used except in pursuance of a resolution of the Federal Council or the Executive Committee and in the presence of at least one member of the Federal Council and of the Secretary. Every instrument to which the seal is affixed shall be signed by at least one member of the Federal Council and by the Secretary.

By-laws.

51. (i) Save so far as determined by statute or by the regulations the constitution duties powers and mode of procedure of the Federal Council and of all committees including the Executive Committee appointed pursuant to these regulations and the appointment duties powers and privileges of all officers shall be such as may from time to time be prescribed and determined by or in accordance with the By-laws and the By-laws may from time to time be added to, amended, altered or repealed by the Federal Council in general meeting. And the Federal Council in general meeting shall be deemed to have full power to make By-laws on all such matters and on all other matters relating to the affairs of the Federal Council or for the purpose of carrying out its objects and all By-laws so made and for the time being in force shall be binding on the members of the Federal Council as if they formed part of these Articles and shall have full effect accordingly.

(ii) Provided that no resolution to make any addition to or any amendment alteration or repeal of any By-law or to make any new By-law shall have any operation unless :

(*a*) the proposal to make the same shall have been published by the Executive Committee in such manner as the Executive Committee may determine for the information of the members not less than twenty-eight days before the holding of the meeting, and

(*b*) the resolution of the meeting shall have been carried by a majority of not less than three-fourths of the votes given thereon.

By-laws of the Federal Council of the British Medical Association in Australia.

I.—Interpretation.

1. In these By-laws (where not repugnant to the context) :

(i) The expression " the regulations " means the Articles of Association with such modifications thereof or additions thereto as may from time to time be in force.

(ii) Words occurring in these By-laws and also occurring in the regulations shall bear the same respective meanings in these By-laws as they bear in the regulations.

2. These By-laws shall be construed so as not to conflict with the regulations.

II.—Proceedings.

3. The President, if present, shall preside as Chairman of every meeting whether of the Federal Council or of any committee of which he shall be a member. In the absence of the President the Vice-President shall preside and in his absence a Chairman appointed by the meeting. Where the President shall not be a member of the committee, such committee shall have power to appoint its own chairman.

4. Until otherwise determined by the By-laws, three members present in person at any meeting of the Federal Council shall be a quorum provided that such three persons be members of three different Branches. members present in person at any meeting of the Executive Committee shall be a quorum. The quorum for any other Committee shall be determined by the Federal Council or by the By-laws, but if not so determined then in any such case it may be fixed by the Committee. If no quorum shall have been appointed two members of any such Committee shall form a quorum.

If within half an hour from the time appointed for a meeting of the Federal Council a quorum be not present, the meeting shall stand adjourned until a day and hour to be determined by the members present or failing such determination by the Secretary and if at such adjourned meeting a quorum be not

present, those present shall be deemed a quorum provided they represent two Branches.

5. The members present at any meeting of a committee may agree upon a resolution to be submitted to all the members of such Committee with a view to its being signed by each of them and when so signed, subject to the regulations in that behalf, such resolution shall become valid and effectual as if it had been passed at a meeting at which a quorum was present.

6. A committee may include members of the British Medical Association who are not members of the Federal Council.

7. Save as by the regulations or these By-laws otherwise provided each committee may convene its meetings, adjourn and otherwise regulate its proceedings as it thinks fit.

8. Questions arising at any meeting of the Federal Council or of any committee shall be decided by a majority of votes, and in case of an equality of votes, the chairman shall have a second or casting vote.

9. If any appointed member of a committee or sub-committee shall be absent from three successive meetings of that committee or sub-committee such member shall (except in case of illness or for some reason approved by the chairman of the committee or sub-committee) be deemed to have resigned his membership thereof and a casual vacancy shall thereupon arise. If any member of a committee who at the time of his appointment was a member of the Federal Council shall for any reason cease to be a member of the Federal Council he shall be deemed to have resigned his office as a member of such committee.

10. Every committee shall have power to call to its assistance for special purposes persons specially qualified to assist in any branch of the subject referred to it.

11. Casual vacancies occurring on any committee shall be filled by the President.

12. Every committee appointed shall elect a convener of such committee whose duty it shall be to convene all such meetings of that committee as may be necessary or desirable.

13. Every committee shall furnish to the Federal Council a report of its proceedings and decisions within such time as may be fixed by the Federal Council, or if not so fixed then not later than the first meeting of the Federal Council held after the date of the appointment of such committee.

Proxies.

14. Where any member is by the regulations or these By-laws authorized to appoint a proxy to vote at any meeting whether of the Federal Council or any committee, such proxy shall be to the effect following, that is to say:

"The Federal Council of the British Medical Association in Australia.

I, of being a Member of the Federal Council, hereby appoint as my proxy to attend the Meeting of the Federal Council (or of the Committee) to be held on the day of and at any adjournment thereof, and to vote at such Meeting for me.

Dated this day of

(Signed) ."

III.—Expenses.

15. (i) The expenses of members of the Federal Council attending any meeting of the Federal Council, or of a committee or sub-committee thereof, which in pursuance of the regulations are to be defrayed out of the general funds of the Federal Council, are the first class travelling expenses; and in the case of a member attending a meeting who is unable to return home at night from the place of meeting the sum of thirty shillings shall be paid to him for every night necessarily absent from home.

(ii) The expenses of officers or servants necessarily incurred in the execution of their duties and the remuneration duly authorized of any officer or servant or member in return for services actually rendered to the Federal Council shall be paid out of the general funds of the Federal Council unless otherwise determined by the Council.

(iii) To meet the general and other expenses of the Federal Council, the Treasurer of each Branch shall pay to the Federal Council such sum or sums as the Federal Council may require, provided that the total so payable in any year shall not exceed a sum equal to ten shillings per member of the Branch.

Research.

SCHOLARSHIPS AND GRANTS.

THE Council of the British Medical Association has issued the following circular relative to the Ernest Hart Memorial Scholarship and three research scholarships and various grants in aid of research.

Scholarships.

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship, of the value of £200 *per annum*.

Three research scholarships, each of the value of £150 *per annum*.

These scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention or treatment of disease.

Each scholarship is tenable for one year, commencing on October 1, 1930. A scholar may be reappointed for not more than two additional terms. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may hold a junior appointment at a university, medical school or hospital, provided the duties of such appointment do not interfere with his work as a scholar.

Grants.

The Council of the British Medical Association is also prepared to receive applications for grants for the assistance of research into the causation, treatment or prevention of disease. Preference will be given, other things being equal, to members of the medical profession and to applicants who propose as subjects of investigation problems directly related to practical medicine.

Conditions of Award: Applications.

A copy of the regulations relative to the award of the scholarships and grants for 1930 and of the prescribed application form can be obtained on application to Dr. R. H. Todd, Secretary of the Federal Committee of the British Medical Association in Australia, Savings Bank Building, 21, Elizabeth Street, Sydney. The completed application form is required to be submitted to Dr. R. H. Todd not later than March 8, 1930.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated, to whom reference may be made.

ALFRED COX,
Medical Secretary.

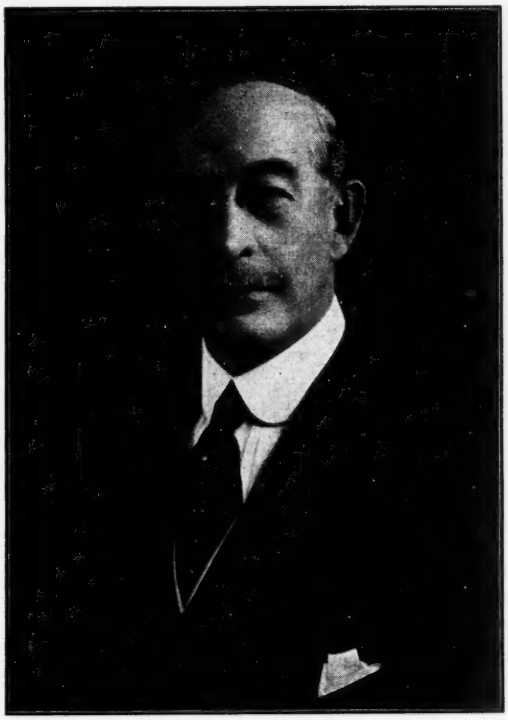
British Medical Association House,
Tavistock Square,
London, W.C.1.
November 1, 1929.

Obituary.

HERBERT WILLIAM JAMES MARKS.

SHORTLY after the death of Herbert William James Marks several of his colleagues were called together to determine how they could best perpetuate the memory of their friend who had rendered such signal service to the community during his professional life. It was resolved to institute at the University of Sydney an annual prize and the medical and other friends of Herbert Marks were invited to contribute to a fund. When the fund is closed, a meeting of subscribers will be called in order to ascertain their wishes in regard to the conditions of the prize.

Herbert William James Marks was born on November 6, 1863, at Jamberoo, Illawarra, New South Wales. His father was a grazier and at one time a member of the New South Wales Legislative Assembly for the Woollahra electorate. Herbert Marks was educated at the Sydney Grammar School. At school he won popularity at an early age. His comrades were attracted to him on account of his manliness, his good nature, his excellence at sport and his keen interest in life. His teachers were attracted to him on account of his ready wit, his brightness and intelligence and his determination to do well. He excelled as a rifle shot while at school and as testimony of this the Marks cup for the best rifle shot is still a coveted prize. He presented the cup to the school. After he left school he was sent to England. He went into residence at Jesus College in the University of Cambridge and worked for a degree in arts. He passed his Bachelor of Arts degree in 1886 and in 1890 he took the degree of Master of Arts. He then went to London and entered the medical school at Saint George's Hospital. In 1895 he secured the diplomas of the conjoint board of the Royal College of Surgeons of England and the Royal College of Physicians of London. He gained the degrees of Bachelor of Medicine and Bachelor of Surgery at Cambridge. After graduation he worked as clinical assistant at the Hospital for Women in Soho and at the Victoria Hospital for Sick Children, Chelsea. About this time he engaged in some research work with Rolleston and published an article on primary malignant disease of the suprarenal capsule. This led him to a further piece of work on congenital tumours of the suprarenal capsules. The result of the second research took the form of a thesis which he submitted to Cambridge. The authorities granted him the degree of Doctor of Medicine on this work. Later he visited Vienna, Berlin and Freiburg where he paid special attention to oto-rhino-laryngological practice. He served for a year as house surgeon at Saint George's Hospital before proceeding to the Continent.



In 1899 he returned to Australia and on February 8 of that year he entered his name on the New South Wales register of medical practitioners. At first he practised as a general surgeon in Macquarie Street, Sydney. Two years later he was appointed honorary surgeon for diseases of the ear, nose and throat at the Lewisham Hospital. He held this position until his death. It seems that in spite of the fact that he started as a general surgeon, his objective was to specialize in ear and throat work and that he undertook general surgery merely to tide him over the longer waiting period of special practice. He soon established a sound reputation in his specialty and his private work increased rapidly. In 1906 he was appointed honorary assistant surgeon for the ear, nose and throat at the Royal Prince Alfred Hospital under Herbert Russell Nolan. In 1912 he was promoted to the senior position at the Royal Prince Alfred Hospital on the resignation of Nolan. According to the rule of the hospital he was required to retire in 1924 at the age of sixty years. He was then appointed honorary consulting surgeon, in accordance with custom.

While Herbert Marks was gaining experience and extending his knowledge both in his hospital and his private practice, it became clear to his colleagues that he was in the front rank of laryngologists and otologists and that he possessed the full confidence of the medical profession. He was noted for his sound diagnosis and his operative skill was universally recognized and admired. In his private work he was very generous to those patients who were not well endowed with this world's goods. No one ever appealed to Herbert Marks for professional help in vain and no one ever found him lacking in sympathy or in willingness to do all that was possible to alleviate or to cure. In 1916 Marks joined the Australian Army Medical Corps Reserve and was given the rank of Honorary Major. He was appointed to the wards at the Royal Prince Alfred Hospital reserved for soldiers needing treatment for affections of the ear, nose and throat. In this way he carried out much highly useful work. Herbert Russell Nolan's death in February, 1915, created a vacancy on the staff of lecturers at the University of Sydney. Shortly after, Herbert William James Marks was appointed lecturer on diseases of the ear, nose and throat. He was an excellent teacher and took an intense and kindly interest in the progress of his students.

In private life Herbert Marks was said to have been one of the most perfect of hosts. He entertained lavishly throughout the greater part of his professional life. He was extremely popular among the members of the honorary staff of the Royal Prince Alfred Hospital. Under all circumstances he was cheerful and amiable, witty and optimistic. He was beloved by his fellow practitioners for his fair and equitable judgement and for his unselfishness. He was always ready to impart to others from his own rich store of information and to pass on to his colleagues what he had gleaned during one or other of his frequent visits to the clinics of the old world. His popularity was enhanced by his great interest in sport. He took pleasure in following all branches of sport, even when he did not participate in that branch himself. He was a great golfer. He presented the Marks trophy to the Royal Sydney Golf Club. He was a keen fisherman and a brilliant shot with rifle and gun. He was an excellent amateur billiard player. He was a foundation member of the Ski Club of Australia and was its first vice-president. He was a member of the Australian Jockey Club and was fond of attending race meetings.

His widow has received numerous indications of the high regard in which her husband was held by all sections of the community and more particularly by the members of his own profession. His contribution to medical science was a valuable one.

Post-Graduate Work.

LECTURE IN ORTHOPÆDIC SURGERY IN SYDNEY.

THE Post-Graduate Work Committee of the New South Wales Branch of the British Medical Association announces that arrangements have been made with Professor Nathaniel Allison, Professor of Orthopædic Surgery at the Harvard Medical School and Chief Orthopædic Surgeon at the Massachusetts General Hospital, to deliver a lecture on

the importance of ocular diagnosis in joint disease in the Maitland Lecture Hall, Sydney Hospital, on January 22, 1930, at eight o'clock in the evening. All medical practitioners are invited to attend.

Books Received.

LA COSTITUZIONE DEGLI EREDOTUBERCOLOSI, by Mario Barbàra; 1929. Bologna: L. Cappelli. Crown 4to., pp. 318. Price: Lire 40.

SURGICAL DISEASES OF THE THYROID GLAND, by E. M. Eberts, M.D., with the Assistance of R. R. Fitzgerald, M.D., and P. G. Silver, M.D.; 1929. Philadelphia: Lea and Febiger. Post 8vo., pp. 238, with illustrations. Price: $3.50 net.

PRACTICAL LOCAL ANÆSTHESIA AND ITS SURGICAL TECHNIC, by R. E. Farr, M.D., F.A.C.S.; Second Edition, thoroughly revised; 1929. Philadelphia: Lea and Febiger. Royal 8vo., pp. 611, with illustrations. Price: $9.00 net.

PHYSICAL MEASURES OF GROWTH AND NUTRITION, by Raymond Franzen, Ph.D.; 1929. New York: American Child Health Association. Royal 8vo., pp. 138. Price: $1.00 net.

BAILLIÈRE'S SYNTHETIC ANATOMY, by J. E. Cheesman; Part IV: The Thigh and Hip;; 1929. London: Baillière, Tindall and Cox. Crown 4to., 12 plates. Price: 3s. net.

NERVE TROUBLES, CAUSES AND CURES, by Cecil Webb-Johnson, M.B., Ch.B.; 1929. London: Methuen and Company, Limited. Crown 8vo., pp. 102. Price: 2s. 6d. net.

HÆMODYNAMICS: THE MECHANISM OF VENOUS CAPILLARY AND LYMPHATIC FLOW: ŒDEMA AND INJECTION OF VARICOSE VEINS, by P. B. Kittel, F.R.C.S.; 1929. London: H. K. Lewis and Company, Limited. Crown 8vo., pp. 206, with illustrations. Price: 10s. net.

AN INTRODUCTION TO THE HISTORY OF MEDICINE, by F. H. Garrison, A.B., M.D.; Fourth Edition, Revised and Enlarged; 1929. Philadelphia: W. B. Saunders Company; Melbourne: James Little. Royal 8vo., pp. 996, with illustrations. Price: 60s. net.

Diary for the Month.

JAN. 21.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JAN. 21.—Section of Obstetrics, Queensland Branch, B.M.A.
JAN. 25.—Queensland Branch, B.M.A.: Council.
JAN. 22.—Victorian Branch, B.M.A.: Council.
JAN. 28.—New South Wales Branch, B.M.A.: Medical Politics Committee.

Medical Appointments.

THE following appointments have been made in the "Mareeba" Babies' Hospital, South Australia: Honorary Consulting Responsible Medical Officer, Dr. Helen Mary Mayo (B.M.A.); Honorary Assistant Physician (Visiting), Dr. Annie Mildred Mocatta (B.M.A.), Dr. William Arthur Pryor (B.M.A.), Dr. Eric James Roby Holder (B.M.A.); Honorary Pathologist (Visiting), Dr. Esmond Frank West (B.M.A.).

* * *

Dr. Garnet Andrew Ross (B.M.A.) has been appointed Senior Medical Officer, Department of Mental Hospitals, New South Wales.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

GOVERNMENT HOSPITAL, KALGOORLIE, WESTERN AUSTRALIA: Resident Medical Officer.

THE BRISBANE AND SOUTH COAST HOSPITALS BOARD: Relieving Out-Patient Physician.

WANGARATTA DISTRICT HOSPITAL: Resident Medical Officer.

WOOROLOO SANATORIUM, WESTERN AUSTRALIA: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 21, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting apopintments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Mount Isa Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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